THE ASSAM
ROYAL GLOBAL UNIVERSITY
GUWAHATI

List of Programme Outcomes and Course Outcomes

The Assam Royal Global University
Guwahati – 35

THE ASSAM
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GUWAHATI

Programme Outcomes and Course Outcome

B.Sc-Biochemistry

The Assam Royal Global University

Guwahati – 35

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Nature and extent of the B.Sc. (Hons.) Programme:

The course is designed as per the UGC regulation for a period of 4 years where the students have to study Core courses in Biochemistry, advance courses in Biochemistry known as Discipline Specific Elective Courses, Generic Elective Courses to which the students will study in other departments, skill Enhancement Elective Courses and Ability Enhancement Compulsory Courses. Generic Elective Courses will be opted by the students depending on their choice in other departments as per the courses available in other departments of the particular university/institution. In first four semesters the students are provided basics of Biochemistry syllabus, besides the courses which they have to opt in other departments.

PROGRAM OUTCOME:

On Successful completion of this program the graduates shall have:

PO 1: Knowledge of Biochemistry

Ability to apply the fundamental knowledge of Biomolecules, protein, biochemical techniques in the area ofbiochemistry.

PO 2:Communication Skills

Ability to communicate effectively.

PO 3:Critical thinking and problem solving

Ability to conduct experiment, analyze and interpreted the results.

PO 4:Analytical reasoning

An ability to identify, formulate and solve the problems in the area of biochemistry.

PO 5:Research Skill

An ability to use the techniques, skills and modern professional tools necessary for professional practice and for research.

PO 6:Team work and time management

Ability to function in a multidisciplinary team.

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PO 7:Scientific reasoning

An ability to learn a system with its component, or process to meet desired need within realistic constraints.

PO 8:Self direct learning

A knowledge of contemporary issues in the area of biochemistry.

PO 9:Digital Literacy

An ability to use the techniques, skills and modern professional tools necessary for professional practice and for research.

PO 10:Moral and Ethical values

An understanding of professional and ethical responsibilities

PO 11:Leadership qualities

An ability to apply the relevant knowledge and managerial skills to manage the project of multidisciplinary nature.

PO 12:Life long learning

A recognition of the need for and an ability to engage in lifelong learning in the area of biochemistry.

PROGRAM SPECIFIC OBJECTIVES:

PSO 1- Students shall be able to identify, formulate and solve the problems of endocrine disorders in the area of hormone biochemistry.

PSO 2- Students shall be able to conduct the clinical biochemistry, Diagnostic biochemistry experiments as well as to analyze and interpret the results.

PSO 3- Students shall be able to use the biochemical techniques, Genetic Engineering & Biotechnology skills and modern pathological tools necessary for professional practice and for research.

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CORE PAPER : Molecules of Life

Course Objectives

The course aims to provide students with an understanding of biomolecules, the basic building blocks of living organisms, focusing on their structural underpinnings, unique properties, biological roles and functions and inter relations.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	The students will be able to find the role and importance of biomolecules in a living system	**BT1&BT2**
CO 2	The course will provide enough scope to understand the importance of each biomolecules-viz. nucleic acid, carbohydrate, lipid, and protein along with vitamins and water.	**BT2**
CO 3	Students will be able to apply the knowledge in analyzing their role in our day to daylife at a chemical level with a biological perspective	**BT3**
CO 4	Students will take part in hands on approach and laboratory techniques.	**BT4**

CORE PAPER : Cell Biology

Course Objective

The objective of this paper is to offer insights into the basic structure and function of a cell and cellular organelles as well as on the various techniques. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.

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Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Students will understand how these cellular components are used to generate and utilize energy in cells	**BT1&BT2**
CO 2	Students will understand the cellular components underlying mitotic cell division..	**BT2**
CO 3	Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function as well use of various tools and techniqunes in understanding those.	**BT3**
CO 4	Students will analyse the application of cell biology in research.	**BT4**

CORE PAPER : Biomolecules and Cell Biology Practical

Course Objective

The objective of this paper is to offer insights about the practicals based on analysis of biomolecules as well on the cell biology.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Students can relate the application of biomolecules and cell biology.	**BT1**
CO 2	Students will understand the process of making various buffers, buffering range, and its uses and application in biochemical reactions, enzyme activity and blood group variety testing etc.	**BT2**
CO 3	Along with that students will also learn and apply the knowledge of cell biology in practicals and interpret experimental results.	**BT3**
CO 4	Exhibit the cell division methods and development of practical skills in cell biology.	**BT4**

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SEC PAPER: Biochemical assessment of food products

Course Objectives

The aim of the course is to familiarize students with basic food components and their assessment in day to day used food products. The course will acquaint students with the methods of estimating the various basic food components like carbohydrates, lipids, proteins and macro/micro nutrients using different methods.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the importance of various biomolecule and the various food sources of those biomolecules	**BT1&BT2**
CO 2	Perform the different estimating methods for all the biomolecules in the food sources .	**BT2**
CO 3	Apply the knowledge of biochemistry in practicals and interpret experimental results which will be helpful for them in development of practical skills in biochemistry.	**BT3**
CO 4	Understand metabolisms of the various components present in food.	**BT4**

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Have a knowledge of Communication process, verbal, and non-verbal communication	**BT1**
CO 2	Improve the skill of listening processes	**BT2**
CO 3	Develop a life skill on oral group communication- group discussionleadership skills, team management.	**BT3**
CO 4	Have a basic idea of language styles – oral and written communication.	**BT4**

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AECC-2/Subject Name: Behavioural Science - I

Course Objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand self-identity and identity crisis	**BT1**
CO 2	Understand self-esteem	**BT2**
CO 3	Have in depth knowledge of foundation of individual behaviour.	**BT3**
CO 4	Develop a life skill on Time management	**BT4**
CO 5	Have an idea on barriers of communication	**BT4**

GE Paper: Biomolecules

Course Objective

The course aims to provide students with an understanding of biomolecules, the basic building blocks of living organisms, focusing on their structural underpinnings, unique properties, biological roles and functions and inter relations.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the role and importance of biomolecules in a living system	**BT1 &BT2**
CO 2	Apply the knowledge in analyzing their role in our day to day life at a chemical level with a biological perspective as well as hands on approach and laboratory techniques	**BT3&BT4**

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GE Paper: Immunity and health

Course Objectives

The course will provide the basic framework in immunology that will cover the major topics including innate and adaptive immunity, antibodies and antigens, and the molecular events leading to autoimmunity

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Demonstrate the basic knowledge of immunological processes at a cellular and molecular level.	**BT1**
CO 2	Compare and contrast the key mechanisms and cellular players of innate and adaptive immunity and how they are related.	**BT2**
CO 3	Acknowledge the genetic basis for immunological diversity and the generation of immune responses, and molecular basis of allergic and inflammatory responses.	**BT3**
CO 4	Explain the basis of immunological tolerance, autoimmunity and transplantation and immune dysregulation in various disorders	**BT4**

CORE PAPER : Proteins and enzymes

Course Objectives: To provide overview of protein biochemistry and enzymology to undergraduate students since proteins and enzymes are the most versatile functional entities in life. The biochemical, structural, functional and aspects of interaction of proteins and enzymes will be introduced in this course.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe and summarize the molecular, chemical and structural foundations of proteins and enzymes.	**BT1 and BT 2**
CO 2	Discuss and interpret core concepts of enzyme kinetics and activity	**BT2 and BT3**
CO 3	Apply their knowledge in various applications associated with life sciences research as well as in industry and biomedicine.	**BT 3**
CO 4	Analyze outcomes of performed laboratory experiments related to protein biochemistry and enzymology.	**BT 4**

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CORE PAPER : Membrane Biology & Bioenergetics

Course Objectives: The objective of the course is to provide students with the basic understanding of membrane composition, structure-function relationship, properties of membranes, and concepts of bioenergetics.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Summarize and appraise theorganizational and functional details of cell membrane, bioenergetics, membrane transport and photophosphorylation	**BT2 and BT 4**
CO 2	Apply their ideas on membrane dynamics and membrane transport proteins by employing the knowledge of various membrane dynamics techniques	**BT2**
CO 3	Analyze various physiochemical observations which are one or other way related to membrane receptor.	**BT 4**
CO 4	Recall the laws of thermodynamics and relate it to the bioenergetics of oxidative- and photo- phosphorylation	**BT 1 and BT3**

CORE PAPER : Proteins and Enzyme Practical

Course Objectives: Objective of the course is to get students exposed to a biochemistry laboratory and develop good laboratory practices with hands on experience of simple but important biochemical experiments.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe the working principles of various qualitative and quantitative analysis methods	**BT 2**
CO 2	Employ a hands on experience on handling various laboratory equipments, chemicals and instruments	**BT 3**
CO 3	Applyand translatethe knowledge in basic research projects, biomedical research, clinical applications, industrial applications, etc.	**BT2 and BT 3**
CO 4	Analyzeand criticizethe working principles, significance of practical results	**BT 4**

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SEC Paper: Food Adulteration

Course Objectives

To educate about common food adulterants and their effects on health as well as to teach them various biochemical analysis methods for detection of food adulterants.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Identify classes of foods and their contamination by various adulterants and	**BT 1**
CO 2	Describe rules and regulations in relation to the control of food adulteration and power and activity of FSSAI	**BT 2**
CO 3	Examine various biochemical methods and analyze adulterants in milk and milk products, oils and fats, and salt and spices, confectionary, food grains, and beverages etc.	**BT 3 and BT 4**

AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objectives: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Illustrate an improved speaking skill.	**BT 3**
CO 2	Demonstrate a life skill on conversation.	**BT 3**
CO 3	Express the skill of public speaking	**BT 2**

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AECC-4/Subject Name: Behavioural Science - II

Course Objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Express the understanding of culture and personality	**BT 2**
CO 2	Recognize Value.	**BT 1**
CO 3	Demonstrate leadership.	**BT 3**
CO 4	Practice a life skill on motivation	**BT 3**

GE PAPER: Intermediatory Metabolism

Course Objectives

The objective of this course is to provide the students an understanding of the major metabolic pathways associated with biomolecules within a cell and their regulation. It will also provide knowledge about the possible correlation between various metabolic pathways.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Memorize and summarize** about metabolic pathways of various biomolecules and their regulation.	**BT1 and BT2**
CO 2	**Sketch** how these pathways are **related** to each other to maintain tissue homeostasis	**BT3 and BT 4**
CO 3	**Apply** the knowledge of the metabolic pathwaysto **demonstrate**how a compromised functioning of the participating substrate and enzyme molecules and/or defects in their concentrationmay lead to several disorders.	**BT 2**
CO 4	**Examine** the observations which could help students plan targeted therapeutic approach to treat metabolic diseases specially those related to lipid, protein, nucleic acid and carbohydrate metabolism	**BT 4**

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GE PAPER: Biochemical Applications in Forensics

Course Objectives

The course aims to provide an understanding of the applications of biochemistry in forensic sciences through analysis of evidences, which will help students develop analytical and problem-solving skills for real life situation. The course will keep abreast with all recent developments and emerging trends in forensic science thus helping interested students takeup forensic science as future course of study.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Outline the developments in the field of forensic sciences, learn to examine a crime scene for identification of relevant evidences and samples for forensic analysis.	**BT 1 and BT 4**
CO 2	Design the experiments related to crime investigation, operateanalytical instrumental techniques, collection, packaging and forwarding of print or pattern evidences and mathematical and statistical use in forensic science.	**BT 3 and BT 5**
CO 3	Employing the knowledge of biological and chemical sciences for routine forensic investigation like determination of time of death and toxicology studies.	**BT 3**
CO 4	Identifyingthe physiology and biochemistry behind tests like Narcoanalysis, polygraphy, lie detection and facial reconstruction for an unbiased interpretation of evidences.	**BT2 and BT 3**

CORE PAPER : Metabolism of Biomolecules

Course Objectives

The objective of this course is to provide an understanding of metabolism of all the biomolecules, the enzymes involved in such metabolic pathways, their regulation, and importance with regards to metabolic disturbances.

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Course Outcomes:

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand thebasic concept of metabolism: catabolism and anabolism.	**BT1 & BT2**
CO 2	Remember the various metabolism of biomolecules: biosynthesis and degradation pathways and their regulations.	**BT1**
CO 3	Apply the knowledge of metabolic pathways to understand how defects in concentration and imbalanced functioning of the participating substrate and enzymes may lead to several disorders.	**BT3**
CO 4	Analyze the various disorder's observations and plan targeted therapeutic approaches to tackle metabolic diseases, especially those related to lipid, protein, nucleic acid, and carbohydrate metabolism.	**BT4**

CORE PAPER : Metabolism Practical

Course Objectives

Objective of the course is to make students understand methods of assessing levels of different physiologically important molecules such as glucose, pyruvate, specific amino acids, triacylglycerol, and cholesterol and then compare the level with normal physiological level.

Course Outcomes

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Classify the various biological samples and hands-on training to understand the basic working techniques.	**BT2**
CO 2	Understand how glucose, pyruvate, proteins, cholesterol, and neutral triacylglycerol levels can be measured in various samples, such as blood and urine.	**BT1**
CO 3	Apply the gained knowledge to analyze and understand how changes in the physiological level of glucose, triacylglycerols, cholesterol, etc., ultimately result in various health issues.	**BT3 & BT4**
CO 4	Apply a preliminary basic experimental approach to understanding the level of neutral lipid content, glucose, cholesterol, etc., normal vs. disease models.	**BT3 & BT4**

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DSE PAPER: Bioanalytical Techniques

Course Objectives: This course aims to introduce students to various techniques and their underlying principles utilized in biological research, emphasizing practical skills so that students may apply this information to increase their comprehension of the subject and execute these techniques more effectively.

Course Outcomes:

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Learn and understand the principles and applications of spectrophotometry and fluorimetry.	**BT1 & BT2**
CO 2	Understand the fundamentals of several chromatographic procedures, such as gel filtration and ion exchange.	**BT2**
CO 3	Apply the knowledge of electrophoretic methods and principles in protein and nucleic acid analysis.	**BT3**
CO 4	Apply the principles of sedimentation and compare the various types of centrifuges and rotors.	**BT3 & BT4**

DSE PAPER: Plant Biochemistry

Course Objectives

The course aims at providing deep understanding of metabolic processes in plants, plant growth and development, and plant tissue culture.

Course Outcomes:

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Memorize** and understand a plant cell's basic structures, organization, and physiological functions.	**BT1**
CO 2	**Understand** and distinguish carbon assimilation and the methods of carbon assimilation by C3, C4, and CAM plants, photosynthesis and respiration, nitrogen fixation and ammonia assimilation, plant hormones, and plant response against abiotic stresses.	**BT1 & BT2**
CO 3	**Apply** the knowledge in their basic plant research, development of new stress-resistant plant varieties, tissue culture, etc.	**BT3**
CO 4	**Analyze** the difference between C4 and CAM plants, structural differences between various secondary metabolites, and the role of various stresses on plant growths.	**BT4**

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GE Paper: Techniques of biochemistry

Course Objectives

This course aims to introduce students to various techniques and their underlying principles utilized in biological research, emphasizing practical skills so that students may apply this information to increase their comprehension of the subject and execute these techniques more effectively.

Course Outcomes:

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Learn and memorize the principles and applications of spectrophotometry and fluorimetry.	**BT1**
CO 2	Understand the fundamentals of several chromatographic procedures, such as gel filtration and ion exchange.	**BT1**
CO 3	Apply the knowledge of electrophoretic methods and principles in protein and nucleic acid analysis.	**BT3**
CO 4	Apply the principles of sedimentation and compare the various types of centrifuges and rotors.	**BT3**

GE Paper: Immunity and health

Course Objectives

The course will provide the basic framework in immunology that will cover the major topics including innate and adaptive immunity, antibodies and antigens, and the molecular events leading to autoimmunity

Course Outcomes:

On Successful Completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic knowledge of immunological processes at a cellular and molecular level.	**BT1**
CO 2	**Compare** and contrast the key mechanism ad cellular players of innate and adaptive immunity and their relation.	**BT4**
CO 3	Explain the genetic basis for immunological diversity, immune response generation, and the molecular basis of allergic and inflammatory response.	**BT2**
CO 4	Apply the acquired knowledge to understand immunological tolerance, autoimmunity, Transplantation, and immune dysregulation in various disorders.	**BT3**

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CORE PAPER I: Concepts in Genetics

Course Objectives

The aim of the course is to provide knowledge of both mendelian and non-mendelian concepts in genetics to students with a focus on the molecular basis of genetics.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember various topics under Mendels Principle of heredity, gene function and genetics in bacteria, Pedigree analysis, Linkage, crossing over, mapping techniques, and chromosomal aberrations	**BT1 & 2**
CO 2	Understand Mendel's laws and ratios; relationship between genetic inheritance, mechanisms of genetic exchange in prokaryotes; the of concept of recombination and linked genes; use recombination frequencies to determine gene order and distance; genetic mapping in eukaryotes using test crosses; the difference in the genetic basis of sex determination in Humans and Drosophila.	**BT 2 & 3**
CO 3	Apply their knowledge in testing genetic hypothesis through statistical tools; finding recombinationfrequencies to determine gene order and distance; to build genetic mapping in eukaryotes.	**BT3**
CO 4	Analyze inheritance pattern, cytogenetics mapping, pedigree analysis and chromosomal aberrations.	**BT4**

CORE PAPER II : Genetics Practical

Course Objectives

The objective of the course to introduce the students the basic knowledge of simple experiment related to the field of genetics such as pedigree analysis, karyotyping in diseased and normal conditions., isolation of plasmid DNA, restriction-digestion of plasmid DNA, and amplification of a DNA of interest towards understanding of basics of genetic engineering.

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Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand and have a practical knowledge of karyotyping of human chromosomes, pedigree analysis, plasmid isolation and restriction digestion of the same, and amplification of a DNA of interest.	**BT1 & 2**
CO 2	Apply the knowledge gained and the basic techniques learnt in setting up research question in future involving in human genetic disorders and basics techniques to be undertaken while tackling them through genetic engineering	**BT 3**
CO 3	Analyse the online databases such as NCBI Nucleotide, primer designing sites which would help them in future application related to DNA.	**BT3 & 4**

DSE PAPER:CLINICAL BIOCHEMISTRY

Course Objectives

To introduce the various parameters that determine a healthy and diseased state and to understand the workings of disease progression and development.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Identify the method of specimen collection and analysis and outline metabolic disorders, syndromes arising out metabolic disorders and the biochemistry of cancer.	**BT1**
CO 2	Identify and reviewthe various aspects clinical biochemistry, their implications in health, causes and implications of metabolic disorders and the biochemical basis of cancer.	**BT1 and BT2**
CO 3	Apply the knowledge gained to deliberate on clinical findings, check the relation of metabolites and syndromes associated with build-up of metabolites and the biochemical reasons leading to cancer progression	**BT3**
CO 4	Analyze the relation of body metabolites and their deregulation with appearance of metabolic syndromes and relate the build-up of cancer specific conditions in the progression of cancer	**BT4**

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DSE Paper: Microbiology

Course Objectives

The course will provide the fundamental concepts of Microbiology including structure and classification of bacteria, microbial diversity and pathogenesis

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Identify the different types of microorganisms, their importance, and pathogenesis	**BT1**
CO 2	Distinguish the microbial diversity and physiology	**BT2**
CO 3	Apply their knowledge in exploring microbial growth under various situations	**BT3**
CO 4	Analyze the pathogenic characteristics of different microbes	**BT4**

SEC Paper: Biochemical analysis of Blood

Course Objective

The objective of this paper is understand various components of blood, disease related and various biomarkers and parameters of such diseases and their analysis

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** the methods of determination of various blood groups, estimation of various molecules and clinical markers in serum or plasma.	**BT1**
CO 2	**Review** the significance of various clinical markers and working principle of their estimation methods.	**BT2**
CO 3	**Apply** their knowledge in conducting practical, basic research projects, biomedical research, and diagnosis etc.	**BT3**
CO 4	**Analyze** the results of various clinical parameters in normal and pathophysiological conditions.	**BT4**

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GE Paper: Biochemical Correlations of Diseases

Course Objectives

Objective of the course to introduce students to various diseases arising from imbalance inmetabolism and hormonal action, The course also be focusing on autoimmune diseases in human

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Outline and inferabout how hormonal and metabolic imbalance results in numerous health issue	**BT1 and BT2**
CO 2	Apply their understanding/concept on various health issues and available measure.	**BT3**
CO 3	Analyze the root cause of various diseases	**BT4**

GE Paper: Biochemical Applications in Forensics

Course Objectives

The course aims to provide an understanding of the applications of biochemistry in forensic sciences through analysis of evidences, which will help students develop analytical and problem-solving skills for real life situation. The course will keep abreast with all recent developments and emerging trends in forensic science thus helping interested students takeup forensic science as future course of study.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember various topics related to the forensic science	**BT1**
CO 2	Comprehend the developments in the field of forensic sciences	**BT2**
CO 3	Apply their knowledge in observing a crime scene for identification of relevant evidences and samples for forensic analysis.	**BT3**
CO 4	Analyze the importance of collection, packaging and preservation of samples to ensure reliability of data generated.	**BT4**

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CORE PAPER I: Gene Organisation, Replication and Repair

Course Objectives

The objective of the course is to introduce to the students, the basic concepts of genome, DNA structure, genes, chromatin and chromosomes.

Course Outcomes:

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Identify the gene as a physical unit and recognize the structural elements of the chromosome.	**BT1**
CO 2	Describe the process of DNA replication and the various factors involved in regulating the process	**BT2**
CO 3	Distinguish the different types of DNA mutations and the gene expression systems	**BT2**
CO 4	Analyze the different types of DNA repair systems and their importance in living beings	**BT4**

CORE PAPER II : Gene Practical

Course Objectives

The objective of the course is to introduce the students to online nucleotide sequence databases and to the basic knowledge/techniques of DNA-isolation, estimation, amplification, and electrophoretic separation.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recognize** the importance of different chemicals in DNA isolation	**BT1**
CO 2	**Distinguish** the different methods to isolate nucleic acids from different sources	BT2
CO 3	**Apply** their knowledge to conduct and execute experiments	**BT3**
CO 4	**Analyze** and explain the experimental results on the basis of critical analysis	**BT4**

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DSE Paper: Bioinformatics and Biostatistics

Course Objectives:
The course is aimed at introducing the application of bioinformatics and statistics in biology.

Course Outcomes

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the basics of bioinformatics, protein structure visualization, genomics, proteomics, and statistical methods.	**BT1**
CO 2	Identify bioinformatics tools functioning, and the basis for using different statistical methods.	**BT 2**
CO 3	Analyse the bioinformatics tools and learn the hands on techniques	**BT3 & 4**
CO4	Evaluate the different bioinformatics tools and be able to utilize different statistical methods to deal with different types of data	**BT6**

Genetic Engineering and Biotechnology

Course Objectives
The objective of the course is to teach the basics of theoretical aspects of recombinant DNA technology and genetic engineering.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe the fundamental concepts of Genetic engineering	**BT1**
CO 2	Distinguish and explain the concepts of Recombinant DNA Technology, including genome organization, manipulation and cloning	**BT 2& 3**
CO 3	Demonstrate proficiency in applying the quantitative and analytical skills necessary for successful laboratory experiments	**BT 3 & 4**
CO4	Explain the experimental results on the basis of critic analysis	**BT 3 & 4**

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DSE: Gene Expression and Regulation

Course Objectives

The objective of the course is to introduce the basic knowledge of gene transcription, translation, and its regulation in prokaryotes and eukaryotes.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recognize various topics under biosynthesis of RNA, RNA splicing, protein synthesis and degradation, and regulation of gene expression.	**BT1**
CO 2	Recognize difference between DNA replication and transcription, the basics of prokaryotic and eukaryotic transcription, key features of the three classes of eukaryotic RNA polymerases, RNA processing, chemistry of splicing, salient features of genetic code, triplet nature, wobble in the anticodon	**BT2**
CO 3	Apply the knowledge of gene expression and regulation in their basic research projects, medical science, agriculture, industry, etc	**BT3**
CO4	Analyze the genetic differences, and molecular mechanisms regulating gene expression between eukaryotes and prokaryotes	**BT4**

DSE Paper: Genes and Diseases

Course Objectives-

The students will be introduced to the role of genes in the development of various diseases. The course will further dwelve into the role of mitochondria in different diseases.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recognize the effect of mutations on human health	**BT1**
CO 2	Distinguish between the various types of diseases and the different mechanisms that underlie their development	**BT2**
CO 3	Explain the role of different genes in the promotion of diseases	**BT3**
CO4	Distinguish the role of mitochondrial and nuclear genes in diseases.	**BT4**

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CORE PAPER I: Immunology

Course Objectives:
The course will provide the basic framework in immunology that will cover the major topics including innate and adaptive immunity, antibodies and antigens, and the molecular events leading to autoimmunity.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Demonstrate the basic knowledge of immunological processes at a cellular and molecular level.	**BT3**
CO 2	Compare and contrast the key mechanisms and cellular players of innate and adaptive immunity and how they are related	**BT4**
CO 3	Identify the genetic basis for immunological diversity and the generation of immune responses, and molecular basis of allergic and inflammatory responses	**BT2**
CO4	Relate the basis of immunological tolerance, autoimmunity and transplantation and immune dysregulation in various disorders	**BT4**

CORE PAPER II: Immunology Practical

Course Objectives
The course will provide the basic laboratory exposure to the students in the field of immunology

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the basic immunology lab approaches	**BT1**
CO 2	Demonstrate the ability to use discipline specific research techniques	**BT3**
CO 3	Apply their skills to conduct and execute experiments	**BT3**
CO4	Explain the experimental results on the basis of critic analysis	**BT2**

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DSE Paper: Nutritional Biochemistry

Course Objectives

The course aims at providing deep understanding of various nutrients, their metabolism, functions, and deficiency diseases to students.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe the basic concepts of nutritional biochemistry, biochemical basis and nutritional importance of macronutrients, biochemical mechanisms for the symptoms of vitamin deficiencies and excesses, and mineral macronutrients.	**BT1**
CO 2	Apply the knowledge on their diet management, selection of nutrient-rich foodstuffs, maintaining good health, and distinguishing various diseases and disorders caused by nutrient deficiency	**BT3**
CO 3	Analyze the difference between macronutrients and micronutrients	**BT4**

DSE PAPER: Microbial Ecology

Course Objectives:

The objective of the course is to teach the basics of microbial ecology and their role in the ecology of the environment.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recognize the different types of microbial flora	**BT1**
CO 2	Analyse the various food webs in the microbial world	**BT 4**
CO 3	Assess the role of microbes in maintaining soil health and agriculture yields.	**BT 6**
CO4	Relate the role of microbes in migitating environmental pollution	**BT 3**

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DSE PAPER: Cancer Biology

Course Objectives:

The objective of the course is to introduce the students to the various molecular aspects of cancer.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe about the basics of cancer and the various genes affecting cancer	**BT1**
CO 2	Analyse the various factors resulting in cancer development	**BT 4**
CO 3	Interpret the roles of various molecular factors in the progression of cancer.	**BT 3**
CO4	Distinguish the efficacy of different methods of cancer treatment	**BT 2**

DSE PAPER: Advanced Cell Biology

Course Objectives-

The objective of the course is to introduce the students into the workings of cellular organelles and their functioning.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe about the biogenesis of cellular organelles	**BT1**
CO 2	Distinguish the compartmentalization and biochemical regulation of different cellular processes	**BT 2**
CO 3	Analyze the various factors regulating cell division	**BT 3**
CO4	Interpret the various factors involved in cell death	**BT 4**

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DSE PAPER: Virology

Course Objectives:

The Course aims to enable the students to understand the basics of learning virology and to impart knowledge on the implications of human viral diseases and newer emerging viral infections.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the basics of Virology	**BT1**
CO 2	Recognise the classification and the diversity of viral genomes	**BT 1**
CO 3	Describe the various replication strategies employed by DNA and RNA viruses	**BT 2 & 3**
CO4	Analyse anti-viral therapies and the patterns of emergence of new epidemics	**BT3**

DSE Paper: Human Physiology

Course Objectives-

The course is aimed at introducing students to the basics of human physiology and into the functioning of the different organ systems and the co-ordination between them.

Course Outcomes –

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe and comprehend the mechanistic insights and the hormonal regulation of processes like digestion, respiration etc	**BT2**
CO 2	Distinguish the various components of blood and the cardiovascular system.	**BT 2**
CO 3	Explain renal physiology, urine formation, and blood pressure regulation.	**BT2**
CO4	Analyze idea about the neuroendocrine system and relate the gained knowledge in understanding control and co-ordination.	**BT 4**

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Working with proteins

Course Objectives

To introduce the students to the basic laboratory skills needed to work with proteins.

Course Outcomes-

On Successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recognize the biochemistry behind protein isolation	**BT1**
CO 2	Distinguish the differences in isolating proteins from different sources.	**BT 2**
CO 3	Analyse the importance of transferring proteins from gel to the membrane	**BT4**
CO4	Compare the different amino acid functional groups in the protein.	**BT 4**

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Programme Outcomes and Course Outcome

BA- Administrative Services

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Guwahati – 35

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Nature and Extent of Bachelor's Degree Programme in Administrative Services (Honours)

A bachelor's degree in Administrative Services is a 4 years degree course which is divided into 8 semesters as under.

Sl. No.	Semester	Credits
1	BA 1st Semester	24
2	BA 2nd Semester	24
3	BA 3rd Semester	24
4	BA 4th Semester	24
5	BA 5th Semester	26
6	BA 6th Semester	26
7	BA 7th Semester	16
8	BA 8th Semester	16
	Total	180

A student pursuing 4 years undergraduate program in Administrative Services with research in a specific discipline shall be awarded Certificate, Diploma, Degrees and Degree with Research in that discipline on completion of 2nd, 4th, 6th & 8th Semester if he/she secures 48, 96, 148 and 180 Credits respectively. Similarly, for certificate, diploma, degree and degree with research, a student needs to fulfil the associated credits. An illustration of credits requirements in relation to the typeof award is illustrated below:

Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

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Bachelor's Degree (Honours) programs attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, BA (Honours) Course in Administrative Services aims to equip students to qualify for joining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

Programme Outcomes relating to B.A. (Honours) degree programme in Administrative Services

PO-1: Ability to attain systematic or coherent knowledge and understanding of the academic field of academic field of Administration, its different learning areas and applications, and its linkages with related disciplinary areas/subjects.

PO-2: Ability to understand administrative knowledge, understanding and skills required for identifying problems and issues relating to Administration.

PO-3: Enable students to focus on socio-political and economic issues and administrative problems and ability to suggest measures to solve those problems.

PO-4: Demonstrate subject-related skills that a student can use in further studies and future projects with moral and ethical justification.

PO-5: Ability to participate, contribute and provide collective academic challenges in the subject domain. Enhance the students to build leadership quality, co-operation and co-ordination to accomplish the task.

PO-6: Capable the students to use and operate computer literacy and knowledge to study not only political science but also for the entire understanding in life.

PO-7: Ability to listen to and read carefully various viewpoints and engage with high level academic deliberations.

PO-8: Ability to understand and skill to evaluate various social and political issues for further research and critical analysis.

Programme Specific Outcomes of Administrative Services

PSO-1: Knowledge of administration, contemporary social, political, and economic issues

PSO-2: Ability to apply knowledge in terms of problem solving and other issues.

PSO-3: Ability to perform as an Public Servants and policy makers

PSO-4: Acquiring knowledge, competency, and confidence to take up career in Indian Administrative Service and other allied services.

Semester – I

Paper I/Subject Name: Principles of Public Administration

Course Objective:

The purpose of this is to give students a thorough understanding of the principles of administration so that the students will be able to start preparing for the Civil Services

1. To help the students to analyze the basic principles and approaches of Public Administration.
2. The course will also increase student's ability to comprehend the dynamics (both ecological and others) relating to Public organizations

Course Outcomes:

Having successfully completed this module a student will be able to learn-

1. The evolution and growth of the discipline of Public Administration.
2. The basic principles and approaches of Public Administration.
3. The basic concepts and dynamics (both ecological and others) relating to Public organizations.

Paper I/Subject Name: Organizational Behavior and Accountability

Course Objective:

1. To help the students analyze the theories and principles of Administration as a discipline.
2. The course will also increase student's ability to comprehend the dynamics and role of the bureaucracy and administration.
3. To enhance the student's decision making ability and develop communication skills.

Course Outcomes:

1. Students will acquire the knowledge of the elements and principles of Administration as a discipline
2. It will help students acquire theoretical clarity of basic concepts associated to administration and administrative behavior.
3. It will develop student's capacity to understand the dynamics and role of the bureaucracy and administration.

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Paper I/Subject Name: Evolution of Indian Administration and Constitutional framework

Course Objective:

1. Understanding the in-built control mechanisms over constitutional bodies in particular and administration in general.
2. Will understand how Constitutional rules are framed.

Course outcome: Students are expected to learn-

1. Knowledge about the evolution and growth of Indian Administration Basic rules of differentiation, matrices and integration
2. Familiarity with the constitutional framework on which Indian Administration is based.
3. Understanding issues of administration.

Paper I/Subject Name: Exit Polls

Course objectives:

This is a skill enhancement course for data collection techniques and analysis. The students will be given hands on training on using statistical and computing software to better visualize and understand data concepts.

Course Outcomes:

- After competition of the course learners will develop knowledge of exit polls and its techniques.
- Develop the skill of joining a news agency

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes:

On completion of this course students will be expected to -

- Have a knowledge of Communication process, verbal, and non-verbal communication
- Improve the skill of listening processes

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- Develop a life skill on oral group communication- group discussion leadership skills, team management.
- Have a basic idea of language styles – oral and written communication.

AECC-2/Subject Name: Behavioural Science - I

Course objectives:

To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On completion of this course students will be expected to -

- Understand self-identity and identity crisis
- Understand self-esteem.
- Have in depth knowledge of foundation of individual behaviour.
- Develop a life skill on Time management
- Have an idea on barriers of communication.

Paper I/Subject Name: Comparative Public Administrative & Development

Course Objective:

1. This course will help the students to understand the connection between democracy and Public administration,
2. To identify the political and administrative possibilities inherent in democracy and analyze the issues relating to the governance.

Course Outcomes:

Students are expected to learn-

1. The knowledge and conceptual clarity of approaches, indices, and models of comparative Public Administration.
2. Students will acquire clarity of administrative systems and their accountability mechanisms of UK, USA and France.
3. It will help them in Civil Services.

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Paper I/Subject Name: CLIMATOLOGY AND OCEANOGRAPHY

Course Objective:

- This course is designed as an Understand the atmospheric elements, processes and resultant weather and climates.
- Comprehend the impact of climates on planet earth.

Course Outcomes

1. Students will be acquainted with the oceanic processes, ocean floor topography and marine resources
2. They will have an idea of Geography which is a very important component of Civils
3. It will help immensely in Prelims of Civil Services.

Paper I/Subject Name: Union Government, Law and Order Administration

Course Objective:

1. To gain a detailed understanding of the salient features, sources and form of government in the country by studying the provisions of the Constitution of India.
2. To study the nature of the Constitution by focusing on the centre-state relationship in the federal structure of the country.

Course Outcomes:

Students are expected to learn-

- Knowledge about the evolution and growth of Indian Administration.
- Familiarity with the constitutional framework on which Indian Administration is based.
- The art of logical inference and decision making.

Paper I/Subject Name: Constitutional Studies

Course objectives:

This is a skill enhancement course for making use of the Constitution of India for Civil Services

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Course Outcomes:

- After competition of the course learners will develop knowledge of Constitution
- Will have a better understanding about the Constitution.

AECC – 3 (2ND SEMESTER)	
AECC-3/Subject Name:	Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

- Improve speaking skill.
- Develop a life skill on conversation.
- Improve the skill of public speakin

AECC-4/Subject Name: Behavioural Science - II

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

- Understand culture and personality
- Understand Value.
- Demonstrate leadership.
- Develop a life skill on motivation

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Paper I/Subject Public Administration and Administrative Law

Course objectives:

1. To help the students to analyze the various aspects of personnel administration.
2. The course will also increase student's ability to comprehend the Civil Service Reforms.

Course Outcomes:

1. Conceptual clarity related to Public personnel Administration, its issues, career systems and other terms covering various aspects of personnel administration.
2. Detailed understanding of the Public personnel system of the Indian Republic.
3. Critical understanding of issues like Employee associations, Adjudication institutions and processes and Civil Service Reforms.

Paper I/Subject State and District Administration

Course objectives:

1. To help the students to analyze the democratic decentralization in India.
2. The course will also increase student's ability to comprehend the constitutional and administrative ramifications of decentralization.

Course Outcomes:

1. Students will understand constitutional provisions/stipulations for democratic decentralization in India and can identify the political and administrative possibilities inherent in decentralization and analyze the issues relating to the decentralization.
2. The student will have an insight into centre-state relations and development management.

Paper I: Public Sector Undertakings and Organization

Course objectives:

1. To help the students to analyze the Regulatory Authorities; Public - Private Partnerships.

2. The course will also increase student's ability to comprehend the Problems of autonomy, accountability, and control; Impact of liberalization and privatization..

Course Outcomes:

1. Understand various aspects of Public Sector and Public Sector Undertakings in India.
2. Analyze various forms of organization of governing boards
3. Knowledge about privatization and performance of central public sector enterprises in India.

Paper I: Public Policies and Plan Priorities

Course objectives:

1. To help the students to analyze the basic concepts such as public policy, policy analysis, public policy process and governance
2. The course will also increase student's ability to comprehend the policy analysis.

Course Outcomes:

1. The students will understand Public Policy and its formulation and Public Policy in Indian context.
2. Learning various approaches and types of Public Policy will create more curiosity among the students to opt for research in the future.

Paper I: Rural and Urban Local Government

Course objectives:

1. To help the students to analyze the role and relationships of rural local democratic decentralized institutions (PRIs) with other
2. The course will also increase student's ability to comprehend the PRIs related issues and institutions

Course Outcomes:

1. Acquiring the theoretical knowledge and understanding of the evolution and growth of rural local governance with special reference to Panchayati raj institutions
2. Gaining insights about composition, role and functions, resources of Panchayati raj institutions

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Paper I: Indian Polity and Constitution

Course objectives:

1. Understanding the in-built control mechanisms over constitutional bodies in particular and administration in general
2. Delineating the constitutional provisions and dynamics of union -state relationships

Course Outcomes:

1. Knowledge about the evolution and growth of Indian Administration
2. Familiarity with the constitutional framework on which Indian Administration is based.
3. Grasping the role of Union Executive
4. Awareness about the institutions and mechanism in force for citizen-state interface

Paper I: Indian Economy and Economy of Assam

Course Objectives

1. To help the students to analyze the tax structure in India.
2. The course will also increase student's ability to comprehend the different aspects of economy of Assam.

Course Outcomes

1. Understand the concept, need and importance of planning and mobilization of resources.
2. Insight on banking and tax structure in India.
3. Understand the Government Budgeting and Industrial Policies in India.

Semester – V (CORE)

Paper I: : Indian Geography and Geography of Assam

Course Objectives

1. To help the students to analyze the agriculture Problems in India.
2. The course will also increase student's ability to comprehend Human Geography - Demographics, Census data, Mineral and industries in India, Economic infrastructure.

Course Outcomes

1. To understand the basics of geography and Climate in India.
2. Analyze agriculture Problems in India.
3. Knowledge about Human Geography.

Paper I: Public Sector Undertakings and Organization

Course Objectives

1. To help the students to analyze the Regulatory Authorities; Public - Private Partnerships.
2. The course will also increase student's ability to comprehend the Problems of autonomy, accountability, and control; Impact of liberalization and privatization.

Course Outcomes

1. Understand various aspects of Public Sector and Public Sector Undertakings in India.
2. Analyze various forms of organization of governing boards
3. Knowledge about privatization and performance of central public sector enterprises in India.

Paper I: Indian Polity and Constitution

Course Objectives

1. Understanding the in-built control mechanisms over constitutional bodies in particular and administration in general
2. Delineating the constitutional provisions and dynamics of union -state relationships

Course Outcomes

1. Knowledge about the evolution and growth of Indian Administration
   Familiarity with the constitutional framework on which Indian Administration is based.
2. Grasping the role of Union Executive
3. Awareness about the institutions and mechanism in force for citizen-state interface

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Paper I: Social Systems and Social Thinkers

Course Objectives

1. The students will understand the basic concepts of the Indian Society.
2. They will be able to comprehend the basic ideas and link it with the UPSC preparation.

Course Outcomes

1. Students will understand the society better and will be able to comprehend social issues.
2. Students will be able to use the basics of the Sociological thinkers to understand the social problems.

Paper I: Security

Course Objectives

1. To help the students to analyze the Role of external state and non-state actors in creating challenges to internal security.
2. The course will also increase student's ability to comprehend the NIA, NATGRID, MAC, UAPA, TADA, POTA, NCTC.

Course Outcomes

1. Understand the concept of Linkages between development and spread of extremism
2. Learn the challenges to internal security through communication networks.
3. Analyze Security challenges and their management in border areas.

Paper I: Economic Development

Course Objectives

1. To help the students to analyze the Elements of Inclusive Growth, Need for Inclusive Growth, Indicators of Inclusive Growth.
2. The course will also increase student's ability to comprehend the Investment Models Domestic Investment Models, Public Investment Model, Private Investment Model.

Course Outcomes

1. Understand about economic development and growth.
2. Insight on Inclusive Growth, employment and Infrastructure.
3. Macro overview of economy.

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Paper I: Indian Economics

Course Objectives

1. Understanding the basics of the Indian Economy
2. Awareness about the basic concepts of the Indian Economy

Course Outcomes

1. Knowledge about the Indian Economic system
2. Understanding the factors behind the Indian Economy
3. Understanding the various mechanisms within the economic system

Paper I: Political and Administrative System of Assam

Course Objectives

1. The student will able to analyze the administrative issues in Assam.
2. The student will able to understand the functions of various administrative institutions in Assam

Course Outcomes

1. Understand the administration and governance of Assam.
2. Familiarity with functions and role of various commissions in Assam

Paper I: World Geography

Course Objectives

1. To help the students to analyze the Factors Responsible for the Location of Industries
2. The course will also increase student's ability to comprehend Climatology

Course Outcomes

1. Familiarity with the Universe - Theories, Formation and recent developments, Basic idea about Earth.
2. Grasping the Mass Movements of landforms, Factors Responsible for the Location of Industries
3. Understanding the Climatology - atmosphere, temperature distribution

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Paper DSE2- Post-Independence History

Course Objectives

1. To help the students to analyze political phenomenon.
2. The course will also increase student's ability to comprehend the relation of India with neighbouring countries.

Course Outcomes

1. To develop in the students an understanding of National Movement towards Freedom & Partition (1939-1947), Nation Building and Foreign Policy.
2. It explains some important processes of Post independent Economy, Society and Polity-Planned Development, Green Revolution.
3. The student will have an insight into the Non-Aligned Movement, Panchsheel, Wars with Pakistan & China, Nuclear Policy.

Paper DSE3-Biodiversity, Environment, Security and Disaster Management in Assam

Course Objectives

1. To help the students to analyze the natural resources and biodiversity of Assam
2. The course will also increase student's ability to comprehend the Environmental Problems in Assam.

Course Outcomes

1. Understand the bio-diversity of Assam, security issues and security management.
2. Analyze the environmental problems, challenges to environment in Assam

Paper DSE4- History of Assam

Course Objectives

1. To help the students to understand the features of the Assamese Culture and Art and Architecture.
2. The course will also increase student's ability to comprehend the effects of British rule on Assam Administration.

Course Outcomes

1. Familiarity with the important medieval states of Assam

Adv

2. Grasping the salient Features of the Assamese Culture and Art and Architecture
3. Understanding the Historical background of the Province of Assam.

Paper /Subject Name: Research Methodology I

Course Objectives:

- To familiarize students about importance of research and research ethics.
- To understand about qualitative research methods
- To familiarize the importance of field study

Course Outcomes:

- Able to understand the importance of ethics in research
- Able to understand the different ways of undertaking research.
- Able to understand the challenges of conducting a field study

Paper -Public policy and administration in India

Course Objectives

1. To provide an introduction to the interface between public policy and administration in India and the essence of public policy responsible for its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living.
2. To enable the students to understand the issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

Course Outcomes

1. The students will be able to understand the Public policy and welfare administration in India along with citizen –Administration interface.
2. Will have an idea of the schemes and policies of the social welfare administration.

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Paper –Research Methodology II

Course Objectives:

- To familiarize students to ways of data collection.
- To understand the concept of sampling.
- To analyse importance of statistical analysis.

Course Outcomes:

- Able to able to make interview schedules.
- Able to use SPSS in data analysis.

Anuradha Dev.

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Programme Outcomes and Course Outcome

B.Sc-Information Technology

The Assam Royal Global University

Guwahati – 35

Anuradha Dev

IQAC
Estd. 2016

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1.1 Nature and extent of the B.Sc. (IT) programme

The most important aspect of computer science is problem solving. It spans the design, development and analysis of software and hardware used to solve problems in a variety of business, scientific and social contexts. It covers the core computer science topics like computer systems architecture, data structures, computer networks, operating systems, computer graphics and multimedia, algorithms, software engineering, database management, theory of computation, Java programming and web technology. The course also facilitates the inclusion of inter- disciplinary subjects as one can choose from a list of Generic electives (GE) as per their field of interest; like for example one can opt for economics, physics, chemistry, photography or videography, art, media or any other subjects offered by different departments and schools of the Assam Royal Global University. Skill enhancement courses enable students to acquire the skill relevant to employability. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Ability enhancement courses like Communication English, Behavioral Science and Functional Assamese honing their personalities and etiquettes and preparing them to be better communicators for better employability. The well- structured LOCF programme for B.Sc.(IT) is designed to empower the students with skills and knowledge leading to enhanced career opportunities in various sectors of human activities.

The bachelor's degree in BCA is a 3 years degree course which is divided into 6 semesters as follows:

YEAR	SEMESTER	CREDITS
I	I	24
	II	24
II	III	24
	IV	24
III	V	26
	VI	26
	Total	**148**

A student pursuing 3 years BSc IT programme shall be awarded a bachelor degree in Computer Application on completion of 6th Semester after securing 148 Credits.

Programme Learning Outcomes for B.SC.(IT)

Programme Outcomes (POs)

- **PO1-Computational Knowledge:** Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.
- **PO2- Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
- **PO3- Design / Development of Solutions:** Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
- **PO4- Conduct Investigations of Complex Computing Problems:** Ability to devise and conduct experiments, interpret data and provide well informed conclusions.
- **PO5- Modern Tool Usage:** Ability to select modern computing tools, skills and techniques

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necessary for innovative software solutions

- **PO6- Professional Ethics:** Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
- **PO7- Innovation and Entrepreneurship:** Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
- **PO8- Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
- **PO9- Communication Efficacy:** Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
- **PO10- Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.
- **PO11- Individual & Teamwork:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.
- **PO12- Life-long Learning:** Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

Programme Specific Outcomes (PSOs)

- **PSO1- Knowledge of Computing Systems:** An ability to understand the principles and working of computer systems.
- **PSO2- Project Development Skills:** An ability to understand the structure and development methodologies of software systems.
- **PSO3: Software Development Skills:** Familiarity and practical competence with a broad range of programming language and open-source platforms.
- **PSO4: Mathematical Skills:** An ability to apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm

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SYLLABUS (1st SEMESTER)

Paper I/Subject Name: Mathematical Foundations

Objective:

The objectives of the course are to review Set theory, Relation & Functions, Matrices and provide student with basics of Analytical Geometry which will help them view things in vector prospective.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **Explain** Sets, Complex numbers, Relations & Functions	BT 1 &BT2
CO 2	**Compare** different Mathematical relations and their use in computer science	BT 2
CO 3	**Apply** concepts of shape and objects in space for computer graphics	BT 3
CO 4	**Analyse** computational problems with the help of mathematical concepts	BT 4

Paper II/Subject Name: Introduction to C Programming

Objective:

The objectives of the course are to give the students exposure to computer programming and make them capable of using the concepts to solve basic as well as advanced computing problems.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **demonstrate** the working of C programming language.	BT 1 & 2
CO 2	**Apply** the programming concepts to solve various problems.	BT 3
CO 3	**Analyse** and debug the errors while writing the programs.	BT 4
CO 4	**Assess** and design a new algorithm to solve a new real life problems	BT 5

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Introduction to C Programming Lab

Objective:

The objectives of the course are to make the student learn about problem solving techniques through C programming language and to enhance the analyzing and problem-solving skills.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** and **understand** the execution of programs written in C language.	BT 1 & 2
CO 2	**Apply** the programming concepts to solve various problems.	BT 3
CO 3	**Analyse** and debug the errors while writing the programs.	BT 4
CO 4	**Assess** and design a new algorithm to solve a new real life problems	BT 5

Paper III/Subject Name: Digital Logic and Computer Design

Objective:

The objectives of the course are to provide an understanding to the students about the Simplification of Boolean expression, combinational and sequential circuits and their implementation through various logic gates

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **understand** the concepts of combinational and sequential circuit design	BT 1 & 2
CO 2	**Apply** the concepts learnt to design digital circuits.	BT 3
CO 3	**Analyse** the outputs produced and behaviour of the different circuits.	BT 4

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Subject Name: Digital Logic and Computer Design Lab

Objective:

The objectives of the course are to make the students implement the given Boolean function using logic gates using both in POS and SOP form

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the implementation of logic gates on the bread board.	BT 2
CO 2	**Build** combinatorial and sequential circuits based on the concepts gained.	BT 3

Paper IV/Subject Name: Web Development with Java Script

Objective:

The objectives of the course are to enable the students to build a robust foundation for computational thinking and make them learn client-side web development.

Prerequisites: Basics of Office Automation

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define and understand** the basic characteristics and concepts of web development.	BT 1 & BT 2
CO 2	**Build** static web pages and manipulate data using JavaScript and work with the HTML Canvas	BT 3
CO 3	**Analyse** and **evaluate** websites in terms of its design and basic processing at the client side.	BT 4 & 5

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Paper V/Subject Name: Multimedia Tools and Applications

Objective:

The objectives of the course are to make the students understand the concept of multimedia entails, Interactive Multimedia, Hypermedia and Multimedia Authoring processes and techniques.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **understand** basic of multimedia concepts	**BT1 & BT 2**
CO 2	**Utilise** tools for developing Multimedia projects.	**BT 3**
CO 3	**Apply** the Multimedia compression technologies to image, audio, animation, and video.	**BT 3**
CO 4	**Compare** and contrast IT tools for authoring 2D and 3D Drawings.	**BT 4**

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-I)

Paper VI/Subject Name: Developing Oral Communication and Listening Skills

Objective:

The objectives of the course are to develop and enhance the students' oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Prerequisites: Basic knowledge of English language

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the elements of a communication	**BT 1**
CO 2	**Understand** the basics of written and oral communication.	**BT 2**
CO 3	**Apply** the concepts learnt in day-to-day life.	**BT 3**

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Paper VII/Subject Name: Concepts of Behavioural Science

Objective:

The objectives of the course are to make the students understand the various elements of behavioral science, the way it is conducted and applied in different research.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the various elements of behavioural science.	BT 2
CO 2	**Apply** the concepts learnt in their real life.	BT 3

Detailed Syllabus of Skill Enhancement Course (SEC-I)

Paper VIII/Subject Name: Image Editing and Animation

Objective:

The objectives of the course are to introduce the students with the concepts and practical skills of Graphics and Animation Development and open-source tools which are freely available for downloading.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and **demonstrate** the basic idea behind image enhancement, modelling, and animation	BT1 & BT 2
CO 2	**Experiment** with image enhancement with the concepts learnt.	BT 3
CO3	**Analyse** any given image for its quality along with the 2D/3D modelling of various architectures.	BT 4
CO 4	**Assess** 3D models for uses in the areas of Interior Designing, Civil Engineering, Gaming etc	BT 5

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Detailed Syllabus of Value Addition Course

Paper IX/Subject Name: Office Automation

Objective:

The objectives of the course are to make the students work with the basic tools under MS office Suite.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** different element presents in office automation	**BT 1**
CO 2	**Understand** the working of the applications under the MS Office Suite.	**BT 2**
CO 3	**Practice** working with sheets, presentations, word documents	**BT 3**

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Computer Organisation and Architecture

Objective:

The objectives of the course are to make the students understand the machine instruction, basic computer organization and memory hierarchy with pipelining processing.

Prerequisites: Basics of Digital Logic and Computer Design

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the various components in a computer, like CPU, Buses, Peripherals and Memory	**BT 1**
CO 2	**Demonstrate** computer architecture concepts related to design of modern processors, memories and I/O	**BT 2**
CO 3	**Experiment** with and **analyse** the performance of commercially available computers	**BT 3 & 4**

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Paper II/Subject Name: Introduction to Data Structures

Objective

The objectives of the course are to teach the basic concept and techniques which form the object-oriented programming paradigm.

Prerequisites: Basics of Programming

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **understand** the basic concepts of OOP and basic constructs of data structure, implementation, and application.	**BT1 & BT 2**
CO 2	**Construct C++** programs and find errors in it.	**BT 3**
CO 3	**Analyse** a problem and construct suitable data structure with C++	**BT 4**
CO 4	**Asses** suitable algorithms in real life problem	**BT 5**

Data Structures using C++ Lab

Objectives

The objectives of the course are to make the students develop skills to design and analyze programs with simple linear and non-linear data structures and analyze their complexities.

Prerequisites: Basics of C Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand and define** the application of elementary data structures such as stacks, queues, linked lists, trees and graphs	**BT 1 & BT 2**
CO 2	**Utilize** appropriate data structures to solve various problems.	**BT 3**
CO 3	**Analyse** and **evaluate** algorithms for its efficiency.	**BT 4 & 5**

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Paper III/ Subject Name: Object Oriented Programming using C++

Objective:

The objectives of the course are to teach the basic concept and techniques which form the object-oriented programming paradigm.

Prerequisites: Basics of Programming

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of OOP.	BT 2
CO 2	**Build** C++ programs and find errors in it.	BT 3
CO 3	**Analyse** a problem and construct a C++ program that solves it.	BT 4
CO 4	**Criticise** a C++ program and describe ways to improve it.	BT 5

Object Oriented Programming using C++ Lab

Objective:

The objectives of the course are to make the student learn C++ programming language to solve various real life problems.

Prerequisites: Basics of Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **interpret** the basic concepts of OOP	BT 1 & 2
CO 2	**Solve** problems by writing C++ programs.	BT 3
CO 3	**Analyse** and **evaluate** programs for its efficiency.	BT 4 & 5

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Detailed Syllabus of Generic Elective-III

Paper IV/Subject Name: Server-Side Programming

Objective:

The objectives of the course are to teach students the process to build web applications using the Ruby on Rails framework.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the process of building web applications using Rails database	**BT 2**
CO 2	**Build** dynamic web applications.	**BT 3**
CO 3	**Assess and evaluate** server side of web applications.	**BT 4**

Detailed Syllabus of Generic Elective-IV

Paper V/Subject Name: Introduction to Cyber Space

Objective:

The objectives of the course are to make the students understand the concept of Cyber Security and its related issues and challenges as well as to make them aware of the e-commerce applications.

Prerequisites: Basics of Computer Network, Web technology

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the different forms of Cyber Security threats and vulnerabilities.	**BT 2**
CO 2	**Experiment** with the adverse effect of social media on people.	**BT 3**
CO 3	**Analyse** and **evaluate** the digital payment system security and remedial measures against digital payment frauds.	**BT 4 & 5**

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Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Conversation and Public Speaking

Objective:

The objectives of the course are to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Prerequisites: Basic understanding of conversation and speaking in public.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various skills of speaking at different levels.	**BT 2**
CO 2	**Apply** the skills learnt in their day-to-day life.	**BT 3**

Paper VII/Subject Name: Understanding Self and Others

Objective:

The objectives of the course are to provide the students insight into the various aspects of self and how one perceives and comprehends other's behaviour in the light of their present appearance

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and visualise one's own self.	**BT 2**
CO 2	**Develop** one's own behaviour.	**BT 3**
CO3	**Analyse** other's behaviour in the light of their present appearance.	**BT 4**

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Detailed Syllabus of Skill Enhancement Courses (SEC-II)

Paper VIII/Subject Name: Windows Programming using C#		Subject Code: INT052S211
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Objective:

The objectives of the course are to enable the students to learn concepts on C# and .NET framework

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** introductory programming concepts using C#	BT 2
CO 2	**Apply** logical alternatives with C# decision structures utilizing iteration, class methods, fields, and properties.	BT 3
CO3	**Simplify** forms, classes, and controls into C# solutions utilizing arrays and file/database access methods	BT 4

Detailed Syllabus of Value Addition Course (VAC-II)

Paper IX/Subject Name: Computer Hardware and Networking

Objective:

The objectives of the course are to explain the different hardware components of a computer system and learn its assembling and disassembling along with various networking devices

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic idea of installation process and components of a PC	BT 2
CO 2	**Experiment** with some hardware components to assemble a computer system.	BT 3
CO3	**Analyse** and **evaluate** different networks to decide for setting up small networks	BT 4

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: JAVA Programming

Objective:

The objectives of the course are to teach the concepts and implementations of object-oriented programming using JAVA language.

Prerequisites: Basics of Procedural or Object-Oriented Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic idea of installation process and components of a PC	BT 2
CO 2	**Apply** the concepts of Java, multithreading and Exception handling to develop efficient and error free codes	BT 3
CO3	**Analyse** and **evaluate** programs for reusability.	BT 4 & 5

JAVA Programming Lab

Objective:

The objectives of this course are to make the students understand and analyze practically the utility of JAVA programming language.

Prerequisites: Basics of Procedural or Object-Oriented Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** he concepts of Java programming.	BT 2
CO 2	**Utilize** an integrated development environment to write, compile, run, and test simple object-oriented Java programs.	BT 3
CO3	**Analyse** and **evaluate** problems for better solutions	BT 4 & 5

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Paper II/Subject Name: Introduction to Database Management Systems

Objective:

The objectives of the course are to make the students learn about databases and the process of designing and constructing data models.

Prerequisites: C/C++, Concepts of Data Structures.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and applications of database systems	**BT 2**
CO 2	**Apply** the basic concepts of MySql and write queries using it.	**BT 3**
CO3	**Analyse** the designed database for normalisation.	**BT 4**
CO 4	**Evaluate** the process of transaction processing and concurrency control	**BT 5**

Introduction to Database Management Systems Lab

Objective:

The objectives of the course to teach the student database design and query processing through MySql.

Prerequisites: C/C++, Concepts of Data Structures

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** a database schema for a given problem-domain.	**BT 2**
CO 2	**Build** queries in MySql with the concepts learnt.	**BT 3**
CO3	**Analyse and evaluate** the queries for its correctness.	**BT 4 & 5**

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Detailed Syllabus of Department Specific Elective (DSE-I)

Paper III/Subject Name: Graph Theory

Objective:

The objectives of the course are to explain the fundamental concepts in graph theory such that it can be used to solve practical problems.

Prerequisites: Concepts of Data Structures

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** mathematical definitions of objects in graph theory.	BT 2
CO 2	**Apply** mathematical concepts to solve graph-related problems.	BT 3
CO3	**Utilize** a combination of theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph	BT 3
CO 4	**Analyse** and critically **assess** a mathematical proof.	BT 4

Paper III/Subject Name: Computer Graphics and Multimedia

Objective:

The objectives of the course are to provide a comprehensive knowledge on the concepts of computer graphics.

Prerequisites: Concepts of Computer Programming and Basic Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** pictures & interact with pictures for presentations	BT 2
CO 2	**Apply** the concepts learnt to implement various shape drawing algorithms, 2D/3D transformations, homogeneous coordinates and	BT 3
CO 3	**Examine** the applications of multimedia and the various multimedia elements.	BT 4
CO 4	**Analyze** the various image, audio, video formats and different compression and decompression standards.	BT 5

Paper IV/Subject Name: Front-End Development with React

Objective:

The objectives of the course are to teach the students about React & Type Script to enable them to create web pages.

Prerequisites: Fundamentals of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** static types and know how to port untyped JavaScript	BT 2
CO 2	**Apply** the concepts learnt to create Single Page Web Applications (SPA) using React, Typescript and Tailwind CSS.	BT 3
CO 3	**Inspect** different elements of front-end development	BT 4

Paper V/Subject Name: IPR and Cyber Laws

Objective:

The objectives of the course are to enlighten the students with various legal, social and international issues and the various remedies available under the Information Technology Act for the breach and commission of offence in cyber space.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concept and idea behind IPR and cyber laws	BT 2
CO 2	**Identify** the various legal, social and international issues and the various remedies available under the Information Technology Act for the breach and commission of offence in cyber space	BT 3
CO 3	**Analyse** the risks around Cyber Security when trading and doing business online.	BT 4

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Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Career Oriented Communication

Objective:

The objectives of the course are to prepare students to adopt different communication strategies and meet the competitive market of employment by considering relevant information related to job requirements.

Prerequisites: Basic understanding of the need to groom oneself for employment and the need for preparation of the same.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the requirement of the job market.	**BT 2**
CO 2	**Build** oneself for the competitive market of employment with the concepts learnt.	**BT 3**

SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Operating Systems

Objective:

The objectives of the course are to teach the basic concepts and functions of operating systems and make them understand the principles of concurrency.

Prerequisites: Concepts of Computer Organization and Architecture

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define & understand** the basic concepts of Operating systems.	**BT 1 & 2**
CO 2	**Apply** the principles of scheduling, and concurrency to solve various problems.	**BT 3**
CO 3	**Analyze** and **evaluate** the execution of simultaneous processes for deadlock.	**BT 4**

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Operating Systems Lab

Objective:

The objectives of the course are to make the students learn about process and disc scheduling practically along with the working of system calls.

Prerequisites: Fundamentals of Computer Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and implement basic services and functionalities of the operating system using system calls.	**BT 2**
CO 2	**Utilize** modern operating system calls and synchronization libraries in software/ hardware interfaces.	**BT 3**
CO 3	**Analyze** various Scheduling algorithms to better usage of the CPU.	**BT 4**

Paper II/Subject Name: Data Communication and Networks

Objective:

The objectives of the course are to make the students understand the significance and concepts of computer networks along with the layered architecture.

Prerequisites: Basics of internet technologies and graph theory

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the significance and concepts of computer networks	**BT 2**
CO 2	**Identify** the layered model for computer networking.	**BT 3**
CO 3	**Analyse** and **evaluate** basic protocols and design issues for layered model.	**BT 4 & 5**

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Data Communication and Networks Lab

Objective:

The objectives of the course are to make the students learn socket programming and to make them familiar with simulation tools.

Prerequisites: Fundamentals of Computer Programming and Data Communication

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the various working of various protocols and understand the utility of socket programming	BT 2
CO 2	**Utilize** simulation tools for network programming	BT 3
CO 3	**Analyze** the performance of the routing algorithms and protocols in different layers.	BT 4

Paper II/Subject Name: Design and Analysis of Algorithms

Objectives

The objectives of the course to understand how the choice of data structures and algorithm impacts the performance of programs and to solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.

Prerequisites: Concepts of Data Structures and Basic Mathematics

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define and classify** asymptotic notation, NP-Hard and NP-Complete Problems, types of algorithms.	BT 2
CO 2	**Apply** different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc	BT 3
CO 3	**Analyse and evaluate** the performance of algorithm	BT 4 & 5

Paper III/Subject Name: Information Theory and Coding

Objective:

The objectives of the course are to teach different coding techniques for information and also give an insight on entropy.

Prerequisites: Concepts of Basic Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** different Information coding schemes	BT 2
CO 2	**Apply** error control coding techniques while receiving information	BT 3
CO 3	**Apply** number theory concepts in encryption and decryption techniques	BT 3
CO 4	**Analyze** the basic encryption and decryption standards.	BT 4

Detailed Syllabus of Generic Elective (GE-VII/VIII)

Paper IV/Subject Name: Web Integration and Application \

Objective:

The objectives of the course are to teach the students the use of pull requests, maintain workflow, and enable them to find appropriate JS language for projects.

Prerequisites: Basics of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the process of integrating websites to applications.	BT 2
CO 2	**Utilize** pull requests to perform development work.	BT 3
CO 3	**Differentiate** between popular JS flavours	BT 4
CO 4	**Choose** between popular JS flavours and pick one that is suitable for a task.	BT 5

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Paper V/Subject Name: Introduction to Game Design and Development

Objective:

The objectives of the course are to enable the students to identify and apply principles of design and modelling along with making them aware of the various issues associate with it.

Prerequisites: Basics of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the fundamental skills and concepts in game design and development.	BT 2
CO 2	**Apply** the concepts learnt to design a new game.	BT 3
CO 3	**Analyze** the designed games for improvement.	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Communication and Presentation Skills

Objective:

The objectives of the course are to prepare students to develop report writing skills, deliver effective presentation and be informed about technology-enabled communication in the 21st century.

Prerequisites: Basic writing skills in English.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the skills required for giving presentations.	BT 2
CO 2	**Build** reports, make presentations and have basic understanding of technology-enabled communication in the 21st century.	BT 3

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Detailed Syllabus of Skill Enhancement Courses (SEC-III)

Paper VIII/Subject Name: System Administration

Objective:

The objectives of the course are to make the students familiar with python and to explain the process of connecting a Unix/Linux server to the network and share resources on the network.

Prerequisites: Basics of Operating Systems

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and analyse the basic system administration tools.	BT 2
CO 2	**Apply** the concepts learnt to administer Unix/Linux machines as standalone workstations or in a network environment.	BT 3
CO 3	**Test** different commands of Linux system	BT 4

Detailed Syllabus of Value Addition Course (VAC-III)

Paper IX/Subject Name: Disaster Management

Objective:

The objectives of the course are to impart a critical understanding for disaster, risks, etc and their reduction and humanitarian response

SYLLABUS (5th SEMESTER)

Paper I/Subject Name: Web Technology

Objective:

The objectives of the course are to provide knowledge on the basic web concepts, scripting languages and Internet protocols

Prerequisites: Basics of computer programming

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Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concept of web development	BT 2
CO 2	**Apply** the concepts learnt to develop simple web applications.	BT 3
CO 3	**Assess** and **evaluate** two web applications based on various design factors.	BT 4 & 5

Web Technology Lab

Objective:

The objectives of the course are to teach the students practically about Internet and Web Page Design by using Markup Languages and XML and also to introduce them to the concept of Server-Side technologies.

Prerequisites: Computer Programming Fundamentals

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the concepts of front end and backend programming for web development.	BT 2
CO 2	**Apply** the concepts on designing web pages.	BT 3
CO 3	**Analyze** and **test** web applications in different web servers	BT 4 & 5

Paper II/Subject Name: Python Programming

Objective:

The objectives of the course are to teach the students techniques to build and develop python codes.

Prerequisites: Fundamentals of Computer Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and terminologies of Python Programming	BT 2
CO 2	**Apply** the concepts learnt to write efficient programs	BT 3
CO 3	**Analyze** and **evaluate** the codes to fix the errors	BT 4 & 5

Python Programming Lab

Objective:

The objectives of the course are to enable students to write compile and run pythons scripts to solve problems.

Prerequisites: Fundamental Concepts of any Programming Language

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the basic concepts of Python Programming and **Demonstrate** proficiency in the handling of loops and creation of functions.	BT 1 & BT2
CO 2	**Implement** different data structures using Python	BT 2
CO 3	**Apply** the commonly used operations involving file handling.	BT 3
CO 4	**Develop** logic of various programming problems using numerous data types and control structures of Python.	BT 3

Detailed Syllabus of Department Specific Elective (DSE-III/IV)

Paper III/Subject Name: Introduction to Data Mining

Objective:

The objectives of the course are to introduce basic data mining concepts and techniques so that the students can discover various patterns from given data

Prerequisites: Concepts of Database Management Systems

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Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and process of mining data	BT 2
CO 2	**Apply** statistical methods to preprocess data.	BT 3
CO 3	**Examine** the data to be mined and present a general classification of tasks	BT 4
CO 4	**Evaluate** the supervised and unsupervised models.	BT 5

Paper III/Subject Name: Introduction to Internet of Things

Objective:

The objectives of this course are to make the students understand the vision, applications, market perspective of IOT from a global context.

Prerequisites: Concept of Computer Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of IoT	BT 2
CO 2	**Apply** the concepts learnt on embedded systems	BT 3
CO 3	**Analyze** the basic protocols in wireless sensor networks	BT 4

Paper IV/Subject Name: Introduction to Cloud Computing

Objective:

The objectives of the course are to explain current cloud computing technologies, large data processing and resource management in the cloud and analyze the components of cloud computing showing how business agility in an organization can be created.

Prerequisites: Concepts of Database Management Systems, Networking

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Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the core concepts of the cloud computing paradigm	BT 2
CO 2	**Apply** the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost	BT 3
CO 3	**Analyze** various cloud programming models and apply them to solve problems on the cloud	BT 4

Paper IV/Subject Name: Statistical Computing

Objective:
The objective of this course is to teach the basic rules of probability and to use them in modelling uncertainty in obtaining and recording data.

Prerequisites: Basic concepts of Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** about the types of data, Mean and Median, Standard Deviation and Variance, Range, IQR and Finding Outliers etc.	BT 1
CO 2	**Illustrate** Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable etc.	BT 2
CO 3	**Apply** Sampling Distribution, Central Limit theorem, Sampling distribution of the Sample mean and Proportion, Large Sample Estimation, Point estimation on datasets	BT 3
CO 4	**Analyse** Linear regression and testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line etc.	BT 4

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Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-IX/X)

Paper V/Subject Name: Ethics and Business Communication

Objective:

The objectives of the course are to introduce students to truthfulness, accuracy, honesty, and reason as essential to the integrity of communication skills to make moral decisions.

Prerequisites: Previous knowledge of communication

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** ethical awareness and the ability to do ethical reflection.	**BT 2**
CO 2	**Apply** ethical principles in decision-making	**BT 3**

Detailed Syllabus of Value-Added Course (VAC-IV)

Paper VII/Subject Name: General Awareness for Competitive Examinations

Objective:

The objective of the course is to prepare the students to solve reasoning and quantitative aptitude problems which are asked during most of the interview processes.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** various formulas for solving problems	BT 1
CO 2	**Illustrate** the problems quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem	BT 2
CO 3	**Apply** various formulas and methodology from the course to solve a problem.	BT 3
CO 4	**Analyse** quantitative information (i.e., formulas, graphs, tables, models, and schematics) or reasoning information and draw implications from	BT 4

SYLLABUS (6th SEMESTER)

Paper IV/Subject Name: Theory of Computation

Objective:

The objectives of the course to impart knowledge on regular grammars and regular expressions and teach about the basics of parsing and ambiguity.

Prerequisites: Fundamentals of Set Theory

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the utility and importance of Automata Theory as the basis of all computer science languages design.	BT 2
CO 2	**Solve** and **construct** minimized sample automata and grammars of context free languages.	BT 3
CO 3	**Analyze** the power and limitation of a computer and solve the problems using formal language	BT 4

Paper II/Subject Name: Software Engineering

Objective:

The objectives of the course are to explain the fundaments of software engineering principles and practices, including project management, configurations management, requirements definition, system analysis, design, testing, and deployment.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the various phases of project development.	BT 2
CO 2	**Select** appropriate process model for development depending on the user requirements.	BT 3
CO 3	**Analyze** and **assess** the model developed in terms of risks management and reuse.	BT 4 & 5

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Software Engineering Lab

Objective:

The objectives of the course are to teach the students the generic software development skill through various stages of software life cycle and to ensure the quality of software through software development with various protocol-based environment.

Prerequisites: Computer Programming Fundamentals

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and describe basic concept of UML, design, implementation of test cases	**BT 2**
CO 2	**Construct** various UML diagrams for different applications	**BT 3**
CO 3	**Analyze** how to develop software requirements specifications for a given problem	**BT 4**

Detailed Syllabus of Discipline Specific Elective (DSE-V/VI/VII)

Paper III/Subject Name: Introduction to Big Data Analytics

Objective:

The objectives of the course are to make the students analyse the components of cloud computing and its business perspective and to explain evaluation of the various cloud development tools.

Prerequisites: Concepts of Databases and Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** how to leverage the insights from big data analytics and the various NoSql alternative database models.	**BT 2**
CO 2	**Apply** different analytic techniques on real-time streaming data	**BT 3**
CO 3	**Analyze** resultant data using various statistical measures	**BT 4 & 5**

Paper III/Subject Name: Mobile Application Development

Objective:

The objectives of the course are to teach the maintenance of a Unix/Linux server and to explain connecting a Unix/Linux server to the network, and share resources on the network.

Prerequisites: Fundamental concepts of Computer Programming using C++/JAVA

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts behind application development	**BT 2**
CO 2	**Apply** the techniques learnt to develop new apps	**BT 3**
CO 3	**Analyze** the existing applications and fix the errors in it	**BT 4**

Paper IV/Subject Name: Mobile Computing

Objective:

The objectives of the course are to teach the concept of mobile computing paradigm, its applications and limitations, typical mobile networking infrastructure through a popular GSM protocol.

Prerequisites: Concepts of Computer Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** mobile technologies in terms of hardware, software, and communications and describe how mobile technology functions to enable other computing technologies.	**BT 2**
CO 2	**Utilize** mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures.	**BT 3**
CO 3	**Analyze** any new technical issues related to new paradigm and come up with a solution(s).	**BT 4**
CO 4	**Evaluate** the effectiveness of different mobile computing frameworks.	**BT 5**

Paper III/Subject Name: Introduction to Embedded Systems

Objective:

The objectives of the course are to make the students understand and design embedded systems and real-time systems.

Prerequisites: Fundamental Concepts of Digital Logic, C Programming and Microprocessor

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and identify the unique characteristics of real-time systems	**BT 2**
CO 2	**Apply** real-time systems design techniques to various software programs.	**BT 3**
CO 3	**Analyze** the unique design problems and challenges of real-time systems	**BT 4**

Paper V/Subject Name: Cryptography and Network Security

Objective:

The objectives of the course are to explain the basics of cryptography, kinds of security threats in networks and to learn to find the vulnerabilities in programs and to overcome them and to teach about the models and standards for security.

Prerequisites: Concepts of Number Theory and Networking

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and **illustrate** basic cryptographic algorithms, message and web authentication and security issues.	**BT 2**
CO 2	**Demonstrate** the current legal and ethical issues towards information	**BT 2**
CO 3	**Identify** the applications of different protocol like SSL, TLS etc.	**BT 3**
CO 4	**Analyze** and **assess** the security services and mechanisms	**BT 4**

Paper IV/Subject Name: Introduction to Natural Language Processing

Objective:

The objectives of the course to provide the student with knowledge of various levels of analysis involved in NLP and teach different language modelling.

Prerequisites: Basics of Discreet Mathematics

Course Outcomes

Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the fundamental concepts of Natural Language Processing	BT2
CO 2	**Apply** algorithms for NLP tasks.	BT 3
CO 3	**Test** useful systems for language processing and related tasks involving text processing	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-XI/XII)

Paper VI/Subject Name: Effective Workplace Communication

Objective:

The objectives of the course are to introduce students to areas of concern in the workplace environment like culture, business etiquettes, decision making, and workplace interpersonal relationships
Prerequisites: Basic knowledge of interpersonal communication and organizational communication paradigms.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** business culture, business etiquettes, decision making, and workplace interpersonal relationships.	BT 2
CO 2	**Apply** the concepts learnt in real life for professional and corporate communication.	BT 3

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Detailed Syllabus of Skill Enhancement Course (SEC-IV)

Paper III/Subject Name: Data Analytics with Python

Objective:

The objectives of the course are to provide an basic understanding of Python programming language and its use in Data Science.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** basic data processing concepts in python	BT 2
CO 2	**Compare** and **contrast** different python packages for data processing	BT 2
CO 3	**Develop** Data Science Project using open-source technologies	BT 3
CO 4	**Apply** Data Processing, Visualization and Analytical techniques on data set	BT 3

Detailed Syllabus of Value-Added Course (VAC-V)

Paper III/Subject Name: Programming with R

Objective:

The objectives of the course are to provide an understanding to the students about basic programming in R and its use is data visualization.

Prerequisites: Basics of any Programming language

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of R programming	BT 2
CO 2	**Build** new packages for sharing and reusability	BT 3
CO 3	**Design** application with database connectivity for data analysis	BT 3
CO 4	**Analyse** data from different sources using API	BT 4

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GUWAHATI

Programme Outcomes and Course Outcome

BA-Political Science

The Assam Royal Global University
Guwahati – 35

The Assam Royal Global University IQAC Estd : 2018

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1.1.1 Nature and Extent of Bachelor's Degree Programme in Political Science (Honours)

A bachelor's degree in Political Science with Research is a 4 years degree course which is divided into 6 semesters as under.

Sl. No.	Semesters	Credits	Required Credits	Awards
1	BA 1st Semester	24		
2	BA 2nd Semester	24	48	Award Diploma in UG Program
3	BA 3rd Semester	24		
4	BA 4th Semester	24	96	Award Diploma in UG Program
5	BA 5th Semester	26		
6	BA 6th Semester	26	148	Award Diploma in UG Program
7	BA 7th Semester	16		
8	BA 8th Semester	16	180	
Total Credits in 4 years		180		Award Degree with Research in UG Program

A student pursuing 4 years undergraduate program in Political science with research in a specific discipline shall be awarded Certificate, Diploma, Degrees and Degree with Research in that discipline on completion of 2nd, 4th, 6th & 8th Semester if he/she secures 48, 96, 148 and 180 Credits respectively. Similarly, for certificate, diploma, degree and degree with research, a student needs to fulfil the associated credits. An illustration of credits requirements in relation to the type of award is illustrated below:

By studying the three years Honours Programme in Political Science the students will be able to understand the basics of the subject which will then enable the students to move on with the higher aspects of the subject at the MA and PhD levels.

1.1.2 Aims of Bachelor's Degree (Honours) Programme in Political Science

The overall objectives of the Learning Outcomes-based Curriculum Framework (LOCF) for BA-Honours degree in Political Science are-

1. To impart the basic knowledge of Political theories, principles, models, and laws of traditional and modern Political Science.
2. To impart the students the basic idea of State and governance.
3. Students will be taught how to write analytical essays in the

field of Political Science.

4. To help students to understand the Policy Making process.
5. To help students to get an idea about the basics of International Relations.
6. To introduce the students to the major ideologies of Political Science.

1.2 Programme learning outcomes relating to B.A. (Honours) Degree program in Political Science.

PO-1: Ability to attain systematic or coherent knowledge and understanding of the academic field of Political Science, its different learning areas and its linkages with related disciplinary areas/subjects;

PO-2: Ability to understand political problems by applying critical and analytical thinking related to political issues.

PO-3: Enable students of political science to focus to find out problems related to socio-political and economic issues and ability to suggest measures to solve those problems.

PO-4: Demonstrate subject-related skills that a student can use in further studies and future projects with moral and ethical justification.

PO-5: Ability to participate, contribute and provide collective academic challenges in the subject domain. Enhance the students to build leadership quality, co-operation and co-ordination to accomplish the task.

PO-6: Capable the students to use and operate computer literacy and knowledge to study not only political science but also for the entire understanding in life.

PO-7: Ability to listen to and read carefully various viewpoints and engage with high level academic deliberations.

PO-8: Enable students to understand various social issues and political problems by applying the overall knowledge of political science in solving the cause-effect relationship. Ability to recognize cause-effect relationships and can draw conclusions from data.

PO-9: Ability to understand and skill to evaluate various social and political issues for further research and critical analysis.

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Programme Specific Outcomes for Political Science

PSO-1: Ability to understand the major political concepts, ideas and develop theoretical understanding of politics and political analysis.

PSO-2: Enable the students to understand the process of State machineries and Nation-building.

PSO-3: Enhance the knowledge of contemporary national and international issues relating to socio-economic and political.

PSO-4: Enable students to evaluate the new policies made by the government from time to time.

Paper I/Subject Name: Nationalism in India

Course Objective:

1. To help students understand the struggle of Indian people against colonialism.

2. To acquaint students with the various conflicts and contradictions by focusing on its different dimensions: communalism, class struggle, caste and gender questions

Learning Outcomes/ Course outcomes:

After successful completion of the course, the students will be able to –

CO-1: Understand the value of independence and develop a sense of patriotism, co-operation and belongingness.

CO-2: Analyze the concept of reformism and anti-reformism and the role of social organizations in the 19th century.

CO-3: Acquainted with various conflicts and contradictions by focusing on its different dimensions: communalism, class struggle, caste and gender questions.

C0-4: Realize the harmful effect of division and disintegration and the contributions of Freedom fighters towards nation building.

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1.

Semester – I
Paper I/Subject Name: Understanding Political Theory

Course Objective:

1. To introduce the students to the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends.
2. To acquaint students with the reconciled political theory and practice through reflections on the ideas and practices related to democracy.

Learning Outcomes/ Course outcomes:

After successful completion of the course, the students will be able to –

CO-1: Understand ideas relating to political theory and its approaches as well as it will enable the students to assess the contemporary political trends.

CO-2: Understand basic political values including democracy and its practices.

Semester – I
Paper I/Subject Name: Constitutional Democracy & Government of India

Course Objectives:

1. To acquaint students with the constitutional design of state structures and institutions, and their actual working overtime.
2. To introduce students with the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice.
3. To encourage students to study state institutions and interaction in larger extra-constitutional environment

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Learning outcome/ Course outcomes:

CO-1: Become acquainted with the constitutional proposal of state constructions and organizations, and their actual working overtime.

CO-2: Be encouraged towards a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

CO-3: Understand the changing nature of Federalism in India and the nature of three tier government as well as the provisions of security laws in India.

Semester – I
Paper I/Subject Name: Exit Poll

Course objectives:

1. The course will allow a student to understand how the electoral system works in India.
2. The course will allow the student to understand the pre and post poll analysis of the election system in India.

Learning Outcomes / Course outcomes:

CO-1: The students will be able to join some Media Houses and Political think tanks who needs students for pre and post poll analysis of Elections.

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AECC-1/Subject Name: Communicative English- I: Developing Oral Communication andListening Skills
Subject Code: CEN982A101
L-T-P-C – 1-0-0-1
Credit Units: 1
Scheme of Evaluation: Theory + Viva-Voce + Extempore Speech Continuous Evaluation: 30 Marks Semester End Examination: Component A – Written Examination = 30 Marks Component B +C – Viva-Voce + Extempore speech = 40 Marks

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes:

On completion of this course students will be expected to -

CO-1: Have a knowledge of Communication process, verbal, and non-verbal communication

CO-2: Improve the skill of listening processes

CO-3: Develop a life skill on oral group communication- group discussion leadershipskills, team management.

CO-4: Have a basic idea of language styles – oral and written communication.

AECC-2/Subject Name: Behavioural Science - I

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On completion of this course students will be expected to -

CO-1: Understand self-identity and identity crisis

CO-2: Understand self-esteem.

CO-3: Have in depth knowledge of foundation of individual behavior.

CO-4: Develop a life skill on Time management

CO-5: Have an idea on barriers of communication.

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Semester – I (Generic Electives) (List -I)
Paper I/Subject Name: Indian Political System

Course Objectives:

1. To make the students understand the making of the constitution of India and its salient features. The object shall be achieved by dealing with the understanding the concepts of the organs of the government.

2. To address the role of electoral process in Indian political system and the changing nature of the political parties in the Indian Politics.

Learning Outcomes / Course outcomes:

CO-1: The students will get a basic understanding of the nature of the Constitution of India.

CO-2: The course will enable the students to know about the organs of the government of India and the nature of federalism, party system and the changing roles of the electoral system in India

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Semester – I (Generic Electives) (List-2)
Paper I/Subject Name: Electoral System in India

Course Objective:

1. To provide students an understanding of the Electoral processes in India and to familiarize them with the idea of elections in India.
2. To provide students a thorough background in recent trends and changes in the electoral processes in India.

Learning Outcomes/ Course outcomes:

After the completion of the course the students will be able to understand --

CO-1: the elections and its related processes in India

CO-2: a thorough background in recent trends in contemporary Indian Elections and its changing nature and process. This will enable them to generate interest towards the greater democratic process in India.

Semester – II
Paper I/Subject Name: Select Political System

Course Objective:

1. To help the students to have a prior understanding of the Constitutions of UK, USA and China.
2. The students will have an understanding of the political systems of the capitalist and socialist countries as well as the organs and structures of the governments of USA, UK, China.

Learning Outcome/ Course outcomes:

CO-1: Students will get a prior understanding of the concept of Constitutionalism and the political system of United Kingdom which was one of the main sources of Indian Constitution.

CO-2: Students will get an understanding of the making of the constitution of USA and the nature of the bi-party system.

CO-3: Students will have knowledge of the Communist Revolution and the Cultural Revolution and nature of the political system in China

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Semester – II

Paper I/Subject Name: Political Theory: Concepts and Debates

Course Objective:

1. To familiarize students with the basic normative concepts of political theory over and above normative values. Each concept is related to crucial political issues that requires analysis with the aid of our conceptual understanding.
2. To encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit.

Learning Outcome/ Course outcomes:

After the successful completion of the course--

CO-1: Students will be familiarized with the basic normative concepts of political theory. Students will be able to understand and evaluate crucial political issues related to the concepts.

CO-2: Students will be encouraged to be reflective and be able to do critical analysis and explanation of social problems.

CO-3: It enables to appreciate the significance of rights and justice along with formal equality

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Semester – II

Paper I/Subject Name: Political Processes in India

Course Objectives:

1. To provide students an understanding of the political processes to analysis the important political developments in India.
2. To familiarize students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

Course Outcome:

CO-1: The students will have an understanding of the party system from the Congress era to coalition politics in India.

CO-2: The students will be familiarized with the working of the Indian State and the contradictory dynamics of modern state power.

CO-3: The students will get an idea of the changing nature of Indian state in the era of Globalization.

Paper I/Subject Name: Constitutional Studies

Course objectives:

1. This Course will allow a student to understand the basics of the Indian Constitution.
2. Will help a student to understand the core of Indian Political philosophy

Learning Outcomes / Course outcomes:

After the successful completion of the course the students will be able to understand --

CO-1: the basics of the Indian constitution

CO-2: The core of Indian political philosophy

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AECC – 3 (2ND SEMESTER)

AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

CO-1: Improve speaking skill.

CO-2: Develop a life skill on conversation.

AECC-4/Subject Name: Behavioural Science - II

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

CO-1: Understand culture and personality

CO-2: Understand Value.

CO-3: Demonstrate leadership.

CO-4: Develop a life skill on motivation

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Semester – II (Generic Electives) (List -I)

Paper I/Subject Name: Nature of Indian Political Processes

Course Objective:

1. To acquaint the students with the constitutional design of state structures and institutions and their actual working over a period of time
2. To encourage the students towards a study of issues in Indian politics as well as the positive and negative dimensions of Globalizations in a democratic country like India.

Learning Outcomes/ Course outcome:

After completion of the course, the students will be able to understand--

CO-1: the working of the Indian State, paying attention to the contradictory dynamics of modern state power.

CO-2: the political process thus calls for a different mode of analysis-that offered by political sociology.

Paper I/Subject Name: Peace & Conflict Management

Course Objectives

1. This course will help the students at a very early level to grasp the importance of peace and conflict studies. It will help the students to understand the basic theories from political and sociological perspectives.
2. The course will also analyses some of the major thinkers behind peace and conflict studies and they will better understand the problems and solutions to the present day insurgent movements in the different parts of the world.

Learning Outcomes/ Course outcomes:

CO-1: The students will get a prior understanding of peace and conflict studies in India.

CO-2: The students will be able know about the nature of how problems are solved through peace and negotiations at various levels.

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Paper I/Subject Name: Introduction to Comparative Government & Politics

Course Objectives

1. This course will enable the students to understand the functioning of governments and political systems in comparative perspectives.
2. This course exposes the students to concepts and approaches which can apply to understand different political regimes in terms of the origin of governmental structures and their functioning.

Learning Outcomes/ Course outcomes:

After the successful completion of the course the students will be able to understand—

CO1: different approaches to explain the functioning of different types of governing regimes.
CO2: the nature of democratic regimes and evaluate their functioning.
CO3: the critical aspects of electoral democracy that includes functioning of parties and the relation between representation and democracy.

Semester – III Core Paper

Paper I/Subject Name: Theories of Administration

Course Objectives

1. This course will help the students to understand the theories that have shaped the nature and evolution of public administration and the emergence of modern systems of governance and their related structures and processes.
2. Will focus on the Contemporary Developments in public administration.

Learning Outcomes/ Course outcomes:

After the successful competition of the course the students will be able to understand

CO-1: the various schools of administrative thought and theories that shaped the emergence of modern bureaucracy.

CO-2: the theories and approaches to the Study of Public Administration and structure of organisation in an administration.

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Semester – III DSE Paper

Paper I/Subject Name: Feminism Theory and Practices

Course Objectives

1. The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. Feminist theory provides an analytic framework, while at the same time paving the path for political practice.
2. The course will give an idea of the struggle against inequality and oppression and a commitment to political consciousness and activism with a discussion on construction of gender and an understanding of complexity of patriarchy. It will analyse theoretical debates within feminism.

Learning Outcomes/ Course outcomes:

CO-1: The students will have an idea of all the issues related to the Feminist cause from a theoretical point of view

CO-2: The students will have an idea about the various Feminist writers.

Paper I/Subject Name: Theories of International Relations and World History

Course Objectives

1. To prepare students with the basic intellectual tools for understanding International Relations.
2. To make students aware of the implicit Euro - centrism of International Relations by highlighting certain specific perspectives from the Global South.

Learning Outcomes/ Course outcomes:

CO-1: The course will provide a fairly comprehensive overview of the major political developments and events starting from the twentieth century

CO-2: The students will be to understanding the key milestones in world history and equip them with the tools to understand and analyse the same from different perspectives.

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Paper I/Subject Name: Political Institutions and Processes in Comparative Perspective

Course Objectives

1. The students will be taught how to apply comparative methods to study political science.
2. To introduce to the undergraduate students the range of issues, literature, and methods that encompasses comparative political studies.

Learning Outcomes/ Course outcomes:

CO-1: The students will be able to understand the different approaches of studying Comparative Politics and will be able to know the nature of Democratization and Federalism.

CO-2: The students will be able to understand about democratization and about the political

Paper I/Subject Name: Introduction to International Political Economy

Course Objectives

1 To familiarize the students with certain key concepts for analyzing world politics and the core theoretical issues and empirical explanations in the field of International Political Economy (IPE).
2 To introduce students with the key issues pertaining to the relationship between security and economic affairs, the tensions between the 'national' and 'international' for decision making on matters of global economic governance and, politics of international trade, finance and labour

Learning Outcomes/ Course outcomes

After the successful completion of the course the students will be able to understand
CO-1: the working of various international institutions.

CO-2: and will get an insight on the present international issues.

CO-3: the global challenges to nation-states.

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Paper/Subject Name: Public Policy and Administration in India

Course Objectives

1. To provide an introduction to the interface between public policy and administration in India and the essence of public policy responsible for its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living.
2. To enable the students to understand the issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

Learning Outcomes

1. The students will be able to understand the Public policy and welfare administration in India along with citizen –Administration interface.
2. Will have an idea of the schemes and policies of the social welfare administration.

Paper/Subject Name: Global Politics

Course Objectives

1. To introduce students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions.
2. To impart an understanding of the working of the world economy, its anchors and resistances offered by global social movements

Learning Outcomes

1. The students will have Insights into the key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.
2. Understanding of the elements of global politics and Emergence of New World Order.

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Paper/Subject Name: Indian Political Thought I

Course Objectives

1. To introduce students to the political thought in a historical perspective.
2. To expose the students to the main currents of the Indian, Islamic and English political thought.
3. To develop the critical understanding towards the different traditions and strands of political thought in India in particular and in world in general.

Course Outline

Learning Outcomes

1. This course will introduce the specific elements of Indian Political Thoughts panning over two millennia.
2. Enable the students to appreciate the thoughts of various thinkers against specific themes.
3. Shall provide a sense of the broad streams of the Indian thought while encouraging a specific knowledge of individual thinkers and texts and shall be able to understand Ancient and Modern Political Thought in Indian Context.

Paper/Subject Name: Understanding South Asia

Course Objectives

1. The course will introduce the historical legacies and geopolitics of South Asia as a region and shall impart an understanding of the political regime types as well as the socioeconomic issues of the region in a comparative framework.
2. The course also apprises students of the common challenges and the strategies deployed to deal with them by countries in South Asia.

Learning Outcomes

1. The students shall have insights into the key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.
2. Be able to understand and know the elements of global politics.

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Paper/Subject Name: Classical Political Philosophy

Course Objectives

1. This course goes back to Greek antiquity and shall familiarize the students with the manner in which the political questions were first posed.
2. To provide students an understanding of the political philosophy of political thinkers i.e. Hobbes, Locke and Rousseau.

Learning Outcomes

1. After completion of their course, the students will have an insight into the philosophy of politics that emerged at different times under the writings of different political philosophers and their contribution towards the development of the discourse and later political system.
2. Understand the major ideas and contributions of political thinkers in political philosophy.

Paper/Subject Name: Western Political Philosophy -II

Course Objectives

1. The objective is to make the students aware about the general themes of the thinkers from varied social and temporal contexts.
2. To enable the students to understand the major ideas and concepts of modern political philosophers in modern Political Philosophy.

Learning Outcomes

1. The student will be able to explore the convergence of the new aspects and areas of political philosophy.
2. They will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

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Paper/Subject Name: India's Foreign Policy

Course Objectives

1. To teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy.
2. To highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level.

Learning Outcomes

1. The students will: Have an in-depth knowledge of the foreign affairs and developments of foreign policy of India.
2. Have an idea about India's Relations with the USA and USSR/Russia and its Engagement with China & Japan.
3. Understand India's Negotiating Style and Strategies and its role in the Contemporary Multipolar World

Paper/Subject Name: Feminism and Indian Politics

Course Objectives

1. The aim of the course is to explain the debates on feminism and the history of feminist struggles.
2. To introduce the construction of gender and an understanding of complexity of patriarchy and to analyze theoretical debates within feminism and its impact in Indian Politics.

Learning Outcomes

1. The student will: have an understanding of the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as social agents.
2. Will help students to evaluate the complicity of social structures and relations in gender inequality.

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Paper /Subject Name: Research Methodology I

Course Objectives:

- To familiarize students about importance of research and research ethics.
- To understand about qualitative research methods
- To familiarize the importance of field study

Teaching Learning Process: Lecture, Assignment, Individual and Group Presentation, Group Discussion, Rapid Fire Questions, Movie Screening, Use of ICT Tools, Documentary.

Learning Outcomes:

- Able to understand the importance of ethics in research
- Able to understand the different ways of undertaking research.
- Able to understand the challenges of conducting a field study

Paper /Subject Name: Research Methodology II

Course Objectives:

- To familiarize students to ways of data collection.
- To understand the concept of sampling.
- To analyse importance of statistical analysis.

Teaching Learning Process: Lecture, Assignment, Individual and Group Presentation

Learning Outcomes:

- Able to able to make interview schedules.
- Able to use SPSS in data analysis.

Anuradha Das

Director, IQAC
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THE ASSAM
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GUWAHATI

Programme Outcomes and Course Outcome

BA/B.Sc Hotel Management

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd - 2018

Anuradha Das

Director, IQAC
The Assam Royal Global University

SYLLABUS (3rd SEMESTER)

Subject Name: Food Production Theory - III

Course Objective:

The objectives of the course are to introduce students to the concept of quantity food production, institutional and industrial catering and regional Indian cuisine

Course Outcomes:

On completion of this course students will be expected to:

- identify equipment's required for bulk food preparations.
- state the methods of volume feeding
- explain and construct menu planning for industrial and institutional catering
- describe various regional cuisines of India

SYLLABUS (3rd SEMESTER)

Lab I: Food Production Lab– III

Course Objectives:
The course will enable the students to acquire the skills of how to prepare various regional cuisines of India

Course outcome:

After completion of this course the students will be able to:

- **demonstrate the preparations of various regional cuisines of India.**

SYLLABUS (3rd SEMESTER)

Subject Name: Food and Beverage Service Theory – III

Course Objective:

The objectives of the course are to enable the students to define alcoholic beverages, its classification and state fermentation and distillation processes and identify food accompaniments with various types of wine.

Course Outcomes:

On completion of this course students will be expected to:

- define alcoholic beverages
- describe the method of making alcoholic beverages
- classify alcoholic beverages with examples
- state various scales used in measuring the alcoholic strength

SYLLABUS (3rd SEMESTER)

Lab II: Food & Beverage Service Lab - III

Course Objectives:
The course will enable the students to identify different glassware's required for services of different types of alcoholic beverages. Also, will be able to state different temperatures and food accompaniments to serve wines and other alcoholic beverages.

Course Outcome:
The students will be able to demonstrate the services of alcoholic and non-alcoholic beverages along with necessary food accompaniments.

SYLLABUS (3rd SEMESTER)

Lab III: Front Office & Accommodation operation Lab- III

Course Objective:

This paper will give a practical detail into the art of handling the front office, flower arrangement (fresh & artificial), remove the different types of stains from various fabrics.

SYLLABUS (3rd SEMESTER)

Subject: French I

Course Objective:

- To provide in depth knowledge of French language among the students.
- To help students in the development of speaking and reading skills in French language

Course Outcomes:

The student will:

- be able to develop the basic knowledge of French language.
- be able to do the basic conversation in French language.

SYLLABUS (3rd SEMESTER)

GE 5/Subject Name: Front Office and Accommodation Operation-III

Course Objective:

The objectives of the course is to enable the students to handle property management software and also to describe the hotel accounting and night auditing procedures. Also, will enable them to describe the procedures adapted for linen room management in a hotel and state various methods and procedures for flower arrangements (fresh, dry and artificial).

Course Outcomes:

After completion of this course the students will be able to

- handle property management software
- describe the hotel accounting and night auditing procedures.
- describe the procedures adapted for linen room management in a hotel and
- state various methods and procedures for flower arrangements fresh, dry and artificial.

SYLLABUS (4th SEMESTER)

Subject: Food and Beverage service Theory– IV

Course Objective:

The objectives of the course are to enable the students to plan various F & B outlets and describe functional catering and explain Gueridon service with identification of menu for it. Also, will enable them to describe the concept of Kitchen Stewarding and its functions.

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SYLLABUS (4th SEMESTER)

Paper II: Food Production Theory– IV

Course Objective:

The objectives of the course is to enable the students to describe the Larder operations of a kitchen and enable them to identify the different products of a cold kitchen, with proper use of wine and herbs
Prerequisites: Must complete the course credit of previous semesters.

SYLLABUS (4th SEMESTER)

Paper I: Food Safety & Quality

Course Objective:

TO be able to explain the importance of food safety, will be able to state the qualitative parameters to be followed for food safety and explain the importance of hygiene and water sanitation in the food sector

Course Outcome:

After completion of this course the students will be able to:

- explain the importance of food safety,
- state the qualitative parameters to be followed for food safety
- explain the importance of hygiene and water sanitation in the food sector

SYLLABUS (4th SEMESTER)

Subject: Food & Beverage Management and Control

Course Objective:

To state the importance of cost control and management of F & B department

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SYLLABUS (4th SEMESTER)

Subject Name: Food Production Laboratory – IV

Course Objective:

The course will enable the students to demonstrate various international cuisines and identify essential ingredients used in cuisines of different countries of the world. Also, enable them to acquire skills for using different shortening and raising agents and preparation of different stocks and soups.
Prerequisites: Must complete the course credit of previous semesters.

SYLLABUS (4th SEMESTER)

Subject Name: Food Beverage Service Lab-IV

Course Objective:

The objectives of the course are to enable the students to plan various F & B outlets and describe functional catering and demonstrate Gueridon service with identified menu for it. Also, they will be able to demonstrate Kitchen Stewarding and its functions by taking physical inventory.

SYLLABUS (4th SEMESTER)

Subject Name: Front Office & Accommodation Operation Laboratory -IV

Course Objective:

The objectives of the course are to enable the students to execute and demonstrate the Property Management Systems software. Also, to prepare the housekeeping checklist, to plan, execute and evaluate the cleaning procedures of different areas, time and motion study for bed making and servicing a guest room and to design and execute training manual for Housekeeping staff.

Raghubalan,G.& Raghubalan, G.,(2017),Hotel Housekeeping: Operations & Management-Third Edition, Oxford University Press

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SYLLABUS (4th SEMESTER)

GE 7: Front Office and Accommodation Operation- IV

Course Objective:
The student will be able to: -

- plan and evaluate Front Office operations,
- how to identify and prepare the budget requirement of Front Office operations and
- describe Property Management system.
- Also, to plan and evaluate Housekeeping operations,
- how to identify and prepare the budget requirement of Housekeeping operations
- how to execute contracts for outsourcing various services and do energy audit.

SYLLABUS (5th SEMESTER)

Subject Name: Travel & Tourism Marketing

Course Objective:
The course familiarizes the students with marketing concepts, techniques and skills as required in the marketing of tourism products and attractions.
Prerequisites: Must complete the course credit of previous semesters.

SYLLABUS (5th SEMESTER)

Subject Name: Research Methodology

Course Objective:

T o enable the students to state the meaning and objective of Research Methodology, Research Design, explain the methods of data collection and apply different statistical tools to analyze.

Course Outcomes:

On completion of this course students will be expected to:

- Frame and write dissertation of his/her research project topics

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SYLLABUS (6th SEMESTER)

Subject Name: Food Production Theory-VI

Course Objective:

The objectives of the course are to impart the knowledge to the students, how to prepare International Cuisine, Bakery & Confectionery items & Bread Making and different frozen desserts.

COURSE OUTCOME: The students will be expected to:

- State and define different international cuisines
- State and identify different bakery terms and products along with frozen desserts
- Describe the importance of management of the kitchen and other areas of the food production

SYLLABUS (6th SEMESTER)

Subject Name: Food & Beverage Service Theory-VI

Course Objective:

The objectives of the course are to enable the students to describe the food and beverage staff organization, explain the bar operations and state different cocktails and identify their ingredients.
Prerequisites: Must complete the course credit of previous semesters.

COURSE OUTCOME:

The students will be expected to:

- explain the F & B staff organisation
- state the recipes of the different cocktails

SYLLABUS (6th SEMESTER)

Subject Name: Front Office Theory-VI

Course Objective:

The objectives of the course is to impart knowledge to the students of Yield Management concept and Time Share / Vacation Ownership.

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COURSE OUTCOME: The students will be expected to:

- state and define yield management concept
- describe time share and vacation ownership
- explain the measures of front office security and techniques to handle unusual situations
- use of French in conservation with guest

SYLLABUS (6th SEMESTER)

Subject Name: Housekeeping Theory-VI

Course Objective:

The objectives of the course are to enable the students to draw guest room layout, explain safety and security processes to be adopted, explain the interior decoration concepts for hotels.

SYLLABUS (6th SEMESTER)

Paper: Facility Planning

Course Objective:

The objectives of the course is to make the students explain standard operating procedures of hotel planning ,project management and operations

SYLLABUS (6th SEMESTER)

Subject Name: Food Production Lab-VI

Course Objective:

The objectives of the course are to impart skills to the students for preparation of different Menu Preparations

COURSE OUTCOME:

The students will be expected to:

- demonstrate practically the international food items/menu after completion of these above stated practical sessions

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SYLLABUS (6th SEMESTER)

Subject Name: Food Beverage Service Lab-VI

Course Objective:

The objectives of the course are to impart skills to the students to organize various F & B outlets, develop supervisory skills and bar operational skills, including, preparation and service of cocktails, Introduce students to F & B Staff organization & Bar Operations

SYLLABUS (6th SEMESTER)

Subject Name: Front Office Laboratory -VI

Course Objective:

The objectives of the course are to impart skills to work on Property Management Systems

COURSE OUTCOME: The students will be expected to:

- demonstrate the various operations of the guest cycle on PMS

SYLLABUS (6th SEMESTER)

Subject Name: House Keeping Laboratory -VI

Course Objective:

The objectives of the course is to make the students demonstrate standard operating procedures of different housekeeping operations and hands on application of first aid and handling of fire safety/firefighting drill

Course Outcome:

After completion of this course the students will be able to:-

- demonstrate standard operating procedures of different housekeeping operations
- demonstrate first aid applications
- describe fire safety/firefighting drill

SYLLABUS (6th SEMESTER)

Paper: Research Project (Practical)

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Programme Outcomes and Course Outcome

B.Sc-Chemistry

The Assam Royal Global University
Guwahati – 35

Anuradha Das

The Assam Royal Global University IQAC Estd : 2018

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Assam Royal Global University

3.1 Nature and Extent of B.Sc. (Hons.) Chemistry

The curriculum has been designed to have insight in almost all the aspects of chemistry and to build a solid foundation in the subject to choose a career in industry or academics. The syllabus of the core subject very well covers most of the important areas of

chemistry. The curriculum also provides a good measure of flexibility and gives choices to select elective subjects. The B.Sc. (Hons.) chemistry programme provides an opportunity for the students to choose from the prescribed courses comprising core, inter-disciplinary, intra- disciplinary courses, department selective courses, electives and skill enhancement courses.

Programme Outcomes

PO1: **Knowledge of Chemistry**: The students shall gain the foundation and concepts in Chemistry in general. The students shall be able to relate the basic knowledge of Chemistry to the broad understanding of life and industrial processes.

PO2: **Problem analysis:** Identify, formulate, review literature, and analyze complex problems of chemistry and also think methodically, independently and draw a logical conclusion using the principles of chemical and basic sciences.

PO3: **Design/development of solutions**: The student shall have the ability for appreciating, understanding and developing strategies to address problem requiring knowledge and skills of Chemistry and come forward with innovative solutions.

PO4: **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Environment and sustainability**: Understand the impact of chemical synthesis and find out the green route for chemical reaction for sustainable development solutions in environmental context, and demonstrate the knowledge and need of sustainable development.

PO6: **Ethics**: A student should refrain himself/herself from the unethical input like plagiarism, and manipulation of data/information.

PO7: **Teamwork**: Though students may come from diverse fields but they must work in team when needed. The student should behave with fellow classmates in an accommodative as well as meaningful way. There should be some positive outcome

from the team against the concerned issues

PO8: Project Management: One should grow the ability to manage and demonstrate the experiment within the set limit. One should be capable to identify and organize proper resources required for a project for completion with ethical scientific conduct, safety and chemical hygiene is practiced.

PO9: Leadership Quality: Leadership quality is a very coveted characteristic for students which will lead to a very effective class of environment.

PO10: Lifelong learning: Each student should be motivated and groomed such that they become life-long learners which will make them a responsible and contributing citizen to the society.

6. Programme Specific Outcomes:

PSO1: Will get the clear understanding of the fundamental concepts in different branches of chemistry like analytical, organic, inorganic, physical, etc. and its applications through various laboratory experiments.

PSO2: Students will understand nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions and will learn to predict the products of unknown reactions.

PSO3: Students will learn to synthesize the chemical compounds by the required knowledge of various reagents under optimum reaction conditions and research oriented skills will be developed among the students.

PSO4: Understand good laboratory practices and safety and will be able to perform scientific experiments skillfully by applying required knowledge of analytical chemistry.

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Subject Name: Physical Chemistry I	Subject Code: CHY012C101

Objective: The objective of **Physical Chemistry I** is To understand and apply the concepts of classical thermodynamics and kinetics of chemical reactions to measure the rate and feasibility of a reaction.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and gain the knowledge from laws of thermodynamics to solve the complex problems of physical chemistry	BT1
CO2	**Explain** the concept of thermodynamical parameters and their importance to interpret the spontaneity of reaction.	BT2
CO3	**Apply** the knowledge of chemical kinetics and analyze chemical reactions and reaction mechanism.	BT3
CO4	**Analyze** the different energy exchange processes.	BT4

Subject Name: Inorganic Chemistry I

Objective: The objective of **Inorganic Chemistry I** is to provide basic understanding and application of structure of atom and periodicity of atoms along with their bonding prospective to form compounds, also a brief idea of their acid and base properties.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and get the detailed idea of atomic structure, their periodicity and chemical bonding along with acid base properties.	BT1
CO2	**Explain** the principle and apply the knowledge for solving the problems related to their structure and bonding.	BT2
CO3	**Apply** the idea to interpret changes of properties along the periods and group.	BT3
CO4	**Analyze** the details of acidic and basic nature of compounds formed by chemical boding as well as to critically determine titrimetric behaviour.	BT4

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Subject Name: Chemistry Lab I

***Objective*: The objective of Chemistry Lab I** is to provide the knowledge of estimation of chemical species with titrimetric, viscometric and kinetic analysis as well as practical experience of inorganic compound synthesis.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Show** the preparation of inorganic compounds and salt.	BT1
CO2	**Demonstrate** the estimation the impurities in water and inorganic compounds in solutions.	BT2
CO3	**Experiment** with various techniques to determine the chemical elements present in sample.	BT3
CO4	**Compare** the viscosity, surface tension of unknown solutions and to inspect the rate of reaction.	BT4

Subject Name: Preparation and Estimation Techniques

Objective:

The objectives of **Preparation and Estimation techniques** are to make students familiar with organic and inorganic preparation methods with hands on practical. It will also improve the understanding of the concepts of estimation and separation processes.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and gain the preparation knowledge of inorganic compounds.	BT1
CO2	**Explain** the concept of organic synthesis methods	BT2
CO3	**Apply** the knowledge of chromatography in separation of compounds.	BT3
CO4	**Analyse** and **Estimate** the species present by gravimetry.	BT4

Subject Name: Chemistry I (Generic) List-I

Objective: The objective of **Chemistry I (Generic)** is to make students familiar with origin of quantum theory and atomic structure. It will help students to understand the bonding and structure of molecules, and also evaluate acidic-basic character of compounds.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the concepts of quantum theory.	BT1
CO2	**Explain** the theories of chemical bonding.	BT2
CO3	**Apply** the concept of hybridization to geometry.	BT3
CO4	**Examine** the compounds to determine the chemical components present in sample.	BT4

Subject Name: Basic Analytical Chemistry (Generic) (List-II)

Objective: The objective of **Basic Analytical Chemistry** is to provide the basic concept of chemical analysis through separation Techniques and titrimetric analysis. The students will also be able analyse the experimental data using data analysis knowledge.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the importance of chemical analysis with instrumental techniques	BT1
CO2	**Explain** the concept of separation techniques and chromatographic techniques.	BT2
CO3	**Apply** titrimetric analysis in quantitative sample determination	BT3
CO4	**Analyze** the accuracy and types of errors in experimental data.	BT4

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Subject Name: Physical Chemistry-II

Course Objective: The objective of **Physical Chemistry-II** is to learn the concepts of different states of matter, colligative properties of solutions and principles of electrochemistry and to apply it in different chemical reactions.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the ideal and non- ideal behaviors of (real) gas, critical phenomena of gases, solutions properties and electrolytic conduction	BT1
CO2	**Explain** the properties of liquid and conductivity of strong and weak electrolytes.	BT2
CO3	**Apply** the concept of colligative properties to determine the molar mass of solutes.	BT3
CO4	**Compare** the critical phenomena of gases, buffer action, pKa and pKb, buffer solution	BT4

Subject Name: Organic Chemistry-I

Course Objective: the objective of **organic chemistry I** is to provide in-depth knowledge related to the fundamental concepts on organic parameters which is required to rationalize and predict the chemical reactivity

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Illustrate** different parameters like aromaticity, inductive effect, etc. which is vital to understand the chemical reaction	BT1
CO2	**Apply** the concept of chemical kinetics in the field organic reaction mechanism.	BT2
CO3	**Analyse** the stereochemistry of different synthetic molecules.	BT3

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Subject Name: Chemistry Lab II

Course Objective: The objective of **Chemistry Lab II** is to improve the understanding of the theoretical concepts and application of organic chemistry as well as to grow the practical knowledge.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the techniques that are useful in modern applied chemistry.	BT1
CO2	**Interpret** analytical abilities for independent thinking.	BT2
CO3	**Make use** of the functional group analysis of simple organic compounds to synthesize different derivatives of simple organic molecules	BT3
CO4	**Distinguish** different methods for the preparation of complexes	BT4

Subject Name: Basic Preparative Techniques in Chemistry and Food Analysis

Objective: The **Basic preparative techniques in chemistry and food analysis** is to provide the practical knowledge of synthesis of inorganic and organic compounds as well as some basic techniques for determination the adulterants in food stuffs

Course outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the techniques that are useful in preparation of inorganic and organic compounds.	BT1
CO2	**Demonstrate** the synthetic methods for preparation of inorganic and organic compounds of practical importance.	BT2
CO3	**Make use** of the synthetic techniques to prepare different derivatives of simple organic molecules as well as coordination compounds.	BT3
CO4	**Demonstrate** different methods for finding the adulterants in food stuffs.	BT4

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Subject Name: Chemistry of the Environment

Objective: The objective of **Chemistry of the Environment** is to provide the knowledge ofair,water and soil pollution and their control measures as well as principle and application of green chemistry.

Course outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the sources of air, water and soil pollution and explain their mitigation methods as well as basic principles and application of green chemistry	BT1
CO2	**Demonstrate** green methods for mitigation of pollution caused by application of hazardous chemicals	BT2
CO3	**Apply** the knowledge for critically analyze the applications that leads to environmental pollution	BT3
CO4	**Examine** amiable solutions for the problems related to environmental pollution.	BT4

Subject Name: Chemistry II

Objective: The objective of **Chemistry II** is to understand and apply the concepts of thermodynamics, electrochemistry, stereochemistry of chemical reactions to measure feasibility of a reaction.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the concept on stereochemistry, organic synthesis, thermodynamics and electrochemistry	BT1
CO2	**Explain** the electrochemical reaction, stereochemistry for organic synthesis	BT2
CO3	**Apply** the concept in problem solving related to electrochemistry and thermodynamics	BT3
CO4	**Compare** different isomers of organic compounds and thermodynamical properties of a chemical reaction.	BT4

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Subject: Environmental & Green Chemistry

Objective: The objective of **Environmental and Green Chemistry is** to provide the knowledge of major pollutants and different ways of control of air, water and soil pollutions. The students will be able to understand the fundamental concepts of green chemistry and to know the utility of green chemistry in modern synthesis.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the twelve principles of green chemistry and will build the basic understanding of toxicity, hazard, and risk of chemical substances.	BT1
CO2	**Summarize** the innovative approaches to solve the problems related to environmental and societal challenges.	BT2
CO3	**Build** the knowledge of green chemistry in problem solving skills, critical thinking and valuable skills to innovative and find out solution to environmental problems.	BT3
CO4	**Analyze** various chemical products and processes that are less toxic, than current alternatives.	BT4

Subject Name: Inorganic Chemistry II

Objective: The objective of **Inorganic Chemistry-II** is to provide an understanding of the details of molecular orbital theory as well as elaborated discussion on non-transition elements and solid state chemistry.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the molecular orbital theory and understand chemistry of non-transition elements as well as solid state	BT1
CO2	**Illustrate** molecular orbital theory to critically analyze bonding of homonuclear diatomic and hetero nuclear diatomic molecules.	BT2
CO3	**Apply** the chemistry of non-transition elements for understanding of their synthesis and chemical application.	BT3
CO4	**Analyze** the knowledge of chemical bonding for understanding of structure of solids	BT4

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Subject Name: Chemistry Lab III

Objective: The objective of **Chemistry Lab III** is to provide the knowledge of conductometric, pH metric and photophysical principles as well as practical experience of inorganic compound synthesis.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Show** the conductometric and pH-metric titrations that are useful in modern applied chemistry	BT1
CO2	**Demonstrate** the preparation of various inorganic compounds.	BT2
CO3	**Apply** spectrophotometric technique to verify Beer-Lambert's law.	BT3
CO4	**Inspect** and determine the strength of glucose solution, acetic acid in commercial vinegar and percentage of calcium carbonate by various methods.	BT4

DSE Paper I/Subject Name: Organic Chemistry-I

Objective: The objective of **Organic Chemistry II** is to provide concept related to synthetic organic reactions and their mechanism along with information related to reagents used for reaction.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Understand** the concept involved in the reaction via analysis of reaction mechanism related to nucleophilic addition and substitution reaction on aromatic compounds.	BT1
CO2	**Explain** the mechanisms of various chemical reactions of alkanes, alkyl halides, alcohols, alkenes and alkynes.	BT2
CO3	**Apply** the reagents for the conversion of one functional group into other functional group in one or more number of steps.	BT3
CO4	**Analyze** the structures knowledge of commercially important molecules.	BT4

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DSE Paper II/Subject Name: Chemistry of Life

Objective: The objective of Chemistry in Daily Life is to provide the knowledge on materials in practice, their utility, as well as their impact on the Environment if no proper measure.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Find** the knowledge on different classes of pollution, regarding material in practice along with their impact on day to day life.	BT1
CO2	**Relate** the influence of materials in daily life.	BT2
CO3	**Apply** the various phenomenons in the field of biochemistry and material chemistry.	BT3
CO4	**Compare** the knowledge associated with material chemistry to solve the problems of day to day life.	BT4

Subject Name: Chemistry III (Generic)

Course Objective: To provide the basic principles of catalysis and surface chemistry as well as synthesis, property and application of hydroxyl compounds and carboxylic acids. Also to provide the in-depth knowledge of synthesis, property and application of non-transition elements as well as chemistry of coordination compounds.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concepts of catalysis and understand non-transition elements, hydrocarbons and coordination compounds	BT1
CO2	**Explain** the different theories of coordination compouds and allotropes of phosphrous and nitrogen	BT2
CO3	**Apply** Langmuir, Freundlich, Adsorption isotherms for surface phenomenon.	BT3
CO4	**Examine** the compounds to determine the chemical components present in sample.	BT4

Subject Name: Basic Analytical Chemistry (Generic) (List-II)

Objective: The objective of **Basic Analytical Chemistry** is to provide the basic concept of chemical analysis through separation Techniques and titrimetric analysis. The students will also be able analyse the experimental data using data analysis knowledge.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Relate** the importance of chemical analysis with instrumental techniques	BT1
CO2	**Explain** the concept of separation techniques and chromatographic techniques.	BT2
CO3	**Apply** titrimetric analysis in quantitative sample determination	BT3
CO4	**Analyze** the accuracy and types of errors in experimental data.	BT4

Paper I/Subject Name: Physical Chemistry-III		**Subject Code: CHY012C401**
L-T-P-C -3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objective of **Physical Chemistry III** is to make students understand the solids state, phase, co-existence of phases, phase diagrams, concepts of electrochemical cells, electrode potential, electrochemical series and learn about catalyst and surface phenomenon.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the concepts of solid state, phase equilibria, electrochemistry and catalysis	BT1
CO2	**Explain** basic principles of crystallography, phase rule, chemical potential, catalysis and surface phenomenon.	BT2
CO3	**Apply** electrochemical series to explain reactivity of electrodes as well as apply Langmuir, Freundlich, BET equations to attainment of Adsorption isotherms	BT3
CO4	**Analyze** different crystallographic structures according to their co-ordination number and packing factors, and examine distillation process using phase diagram.	BT4

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Subject Name: Chemistry Lab IV

Objective: The objective of **Chemistry Lab IV** is

To make the students understand the application of theoretical concept in the practical application of qualitative inorganic analysis as well as determination of ionic conductivity and specific rotation.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** advanced experimental techniques in separation and determination of inorganic ions	BT1
CO2	**Show** purification and qualitative analysis techniques for analysis of organic liquid samples	BT2
CO3	**Apply** different instruments related to optical property in chemistry	BT3
CO4	**Examine** some modern instrumentation techniques.	BT4

DSE Paper I/Subject Name: Inorganic chemistry III		Subject Code: CHY012D401
L-T-P-C -3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Inorganic chemistry-III** is

- To provide an understanding of the structure and bonding of coordination compounds and organometallic compounds; chemistry of d- and f- block elements and also basic and advanced idea of nuclear chemistry and metallurgy.

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the detailed idea of structure, bonding and property of coordination compounds and organometallic compounds.	BT1
CO2	**Demonstrate** the knowledge of coordination compounds to solve the problems related to their structure, stability and reactivity	BT2
CO3	**Apply** the knowledge of organometallic compounds to analyze their bonding and reactivity as well as their application in catalytic field.	BT3
CO4	**Inspect** critical thinking and analyze the concepts related to stability of nucleus, nuclear reactions and their application for human benefit.	BT4

DSE Paper II/Subject Name: Chemistry of Natural Produc

Objective:

The objective of **Chemistry of natural product** is-

- To provide the basic concept of natural product compounds, their occurrence, structure, biosynthesis and properties.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Find** the knowledge of plant's secondary metabolites and to analyze the new product isolated from plants.	BT1
CO2	**Demonstrate** strategies in organic synthesis for the synthesis of different natural product compounds	BT2
CO3	**Apply** the knowledge of natural pigments and analyze and explore the new herbal organic pigments	BT3
CO4	**Analyze** the synthesis and biosynthesis of natural products having medicinal properties.	BT4

Subject Name: Analytical Laboratory Methods

Objective: The objective of **Instrumental methods of analysis** is to provide the knowledge of volumetric and gravimetric estimation and investigation of individual components after separation

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Show** the importance of analytical methods that are useful in modern chemistry	BT1
CO2	**Demonstrate** the chemistry of precipitation and estimate the inorganic precipitates.	BT2
CO3	**Apply** separation techniques to isolate organic and inorganic compounds from their mixtures.	BT3
CO4	**Inspect** the individual components via various spectroscopic techniques.	BT4

Paper I/Subject Name: Chemistry in Everyday Life

Objective:
The objective of **Chemistry in everyday life** is to provide the knowledge of material along with their influence on the Environment.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Find** the concepts of chemistry related to drugs, colloids and corrosion.	BT1
CO2	**Summarize** the knowledge on awareness on handling chemicals.	BT2
CO3	**Apply** the concepts of chemistry to solve the problems in day to day life.	BT3
CO4	**Analyze** the influence of chemistry in day to day life.	BT4

Subject Name: Chemistry IV (Generic)

Objective: The objectives of **Name: Chemistry IV** is to provide knowledge of chemistry of non-transition elements, fundamental concepts of kinetic theory of gases, liquids and solid.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Understand** the chemistry of organometallic compounds	BT1
CO2	**Demonstrate** the structural characteristics of various types of compounds.	BT2
CO3	**Apply** the knowledge of spectroscopy to analyze the structure of compounds.	BT3
CO4	**Analyze** and apply the knowledge of hydrocarbons for the synthesis of important organic compounds.	BT4

Subject Name: Organic Chemistry III

Objective: The objectives of **Organic Chemistry III** are to provide knowledge of preparation, structure, bonding, properties of carbonyl compounds, carboxylic acids and their derivatives, ethers, aliphatic and aromatic amines, phenols, haloarenes and organo-sulphur compounds.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Understand** the chemistry of carbonyl and heterocyclic compounds	BT1
CO2	**Explain** the mechanisms of various types of reactions involving important functional groups.	BT2
CO3	**Apply** the knowledge of different functional groups to synthesize various commercially important compounds.	BT3
CO4	**Analyze** the role different heterocyclic compounds in natural product compounds	BT4

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Subject Name: Chemistry Lab

Objective: **The objective of Chemistry Lab V** is to provide the knowledge of estimation of chemical species with titrimetric and kinetic analysis as well as practical experience of inorganic compounds and Natural product extraction and estimation.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Show** the estimation of metal	BT1
CO2	**Demonstrate** the extraction of Natural compounds	BT2
CO3	**Experiment** with compounds to determine the chemical components present in sample.	BT3
CO4	**Compare** the conductivity of unknown solutions and to inspect the degree of dissociation of the acid.	BT4

DSE Paper I/Subject Name: Spectroscopy

Objective: The objective of the course is to instill knowledge about the light matter interactions, principles of spectroscopic techniques and to give the preliminary idea about the applications of various spectroscopic techniques.

Course Outcomes:

After successful completion of the course, the students will be able to		
S. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and learn the electromagnetic radiation and basics of spectra	BT1
CO2	**Explain** basic principles of Rotational, Vibrational and Raman Spectroscopy, Electronic Spectroscopy, Spin Resonance Spectroscopy and Mass Spectrometry.	BT2
CO3	**Integrate, compare** and **apply** various techniques in Structure Elucidation of molecules	BT3&4
CO4	**Evaluate** the importance of Selection rules, chemical shift, Chromophore and McLafferty Rearrangement in spectroscopy.	BT5

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Paper DSE II/Subject Name: Supramolecular Chemistry		Subject Code: CHY012D502
L-T-P-C – 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objective:

The objective of **Supramolecular Chemistry** is to understand the fundamental concepts of supramolecular compounds and their application to solve various real-life problems.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl. No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the basic concept, size and synthesis of supramolecular compounds and their practical importance.	BT1
CO2	**Illustrate** non-covalent interactions and self-assembly of molecules.	BT2
CO3	**Apply** the principle of supramolecular compounds for application in various fields of catalysis and molecular devices.	BT3
CO4	**Analyze** the concepts of supramolecular compounds and their applications to resolve scientific problems.	BT4

DSE Paper III/Subject Name: Physical Chemistry-IV

Objective: The objectives of **Physical Chemistry-IV** are to study theories of reaction rate, thermodynamic control of reactions and to understand the properties of colloids and concept involved in polymerization.

Course Outcomes:

After successful completion of the course, the students will be able to		
S. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Understand** the theories of reaction rate for bimolecular and unimolecular reactions	BT1
CO2	**Demonstrate** the applications of statistical thermodynamics and colloidal materials	BT2
CO3	**Apply** the principle of photochemistry for the application in a chemical reaction	BT3
CO4	**Analyze** the laws of photochemical equivalence, polymerization kinetics	BT4

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DSE Paper IV/Subject Name: Polymer Chemistry

Objective: The objective of **Polymer Chemistry** is to provide concepts, and explain how polymer can be crucial which can be invoked to solve problems

Course Outcomes:

After successful completion of the course, student will be able to		
Sl. No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the classes of monomer, polymer and their importance	BT1
CO2	**Illustrate** the polymerization techniques, their mechanism for synthesis, and stereochemistry.	BT2
CO3	**Apply** the methods to calculate the average molecular weight using the equations.	BT3
CO4	**Analyze** the concepts of polymer theories and their applications to resolve scientific problems.	BT4

Subject Name: Green Chemistry

Objective: The objective of Green **Chemistry** is to provide the knowledge and importance of Green chemical approach in modern synthetic practices and its principles and challenges.

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the basic principles and application of green chemistry	BT1
CO2	**Demonstrate** green energy generation processes and catalytical methods for chemical synthesis.	BT2
CO3	**Apply** the knowledge green energy and solvents for sustainable synthesis of commercially important compounds	BT3
CO4	**Examine** green solutions for the problems related to chemical pollution.	BT4

Subject Name: Quantum Chemistry

Course Objective: The basic objectives of this course are to impart quantum mechanical postulates in solving the Schrödinger equation and to apply LCAO-MO theory to real atoms/ions.

Course Outcomes:

After successful completion of the course, the students will be able to		
S. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the postulates and interpret the basic principles of quantum mechanics	BT1&2
CO2	**Apply** quantum mechanical treatment to various models	BT3
CO3	**Construct** atomic-orbital wave functions plot and **solve** spin-orbit interactions for Term symbols	BT3&4
CO4	**Evaluate** the various orbital theories to **solve** for energy values of different molecules	BT 4 & 5

DSE Paper I/Subject Name: Inorganic Chemistry-IV

Objective: The objective of **Inorganic Chemistry-IV is** to provide an understanding of the electronic and magnetic properties of coordination compounds as well as inorganic reaction mechanism, bioinorganic Chemistry and cover the idea of redox reaction and molecular symmetry of inorganic compounds.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the concepts of spectral behaviour, magnetic property and reaction mechanism of coordination complexes.	BT1
CO2	**Explain** basic principles bioinorganic chemistry, redox behaviour and molecular symmetry	BT2
CO3	**Apply** concept of electronic spectra and magnetic behaviour to understand the spectral behaviour as well as magnetic properties of transition metal complexes	BT3
CO4	**Analyze** the redox reactions between species and as well as understand the symmetry of the compounds.	BT4

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DSE Paper II/Subject Name: Food Chemistry

Objective:

The objectives of **Food Chemistry** are

The students will learn the basic knowledge in Food Chemistry and modern trends in the industry along with concept of the food adulteration and quality control in the food analysis.

Course Outcomes:

After successful completion of the course, the students will be able to		
S. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** food and **identify** constituents of food.	BT1
CO2	**Explain** the types of food nutrients	BT2
CO3	**Understand** and **demonstrate the** importance of nutrition and balanced diet	BT2
CO4	**Apply** the food adulteration in quality control	BT3

Paper DSE III/Subject Name: Analytical Chemistry

Objective: The objectives **Analytical Chemistry** is to offer the students will learn the importance of analytical data and basic concepts of separation and analysis of organic and inorganic materials.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and represent analytical data obtained from analytical methods.	BT1
CO2	**Demonstrate** importance of purification and identification of analytes.	BT2
CO3	**Apply** the knowledge of analysis to understand the nature and properties of individual components.	BT3
CO4	**Categorize** and estimate and the chemical species present in the sample.	BT4

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DSEPaper IV/Subject Name: Chemistry of Cosmetics and Antioxidants

Objective:

The objectives of **Chemistry of Cosmetics and antioxidants** are

This module aims to provide an understanding of the concepts behind the cosmetics and their production.

Course Outcomes:

After successful completion of the course, the students will be able to		
S. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Understand** cosmetics and their role in beauty and wellness.	BT1
CO2	**Discuss** the types of personal care products	BT2
CO3	**Evaluate** the adverse effects of cosmetics and emergence of herbal cosmetics	BT2
CO4	**Apply** the benefit of antioxidants in beauty products	BT3

DSE Paper V/Subject Name: Organic Chemistry IV

Objective: The objectives of **Organic Chemistry IV** are:

- To provide an understanding of organic photochemical reactions
- To provide an understanding of structure, properties of carbohydrates, terpenes and alkaloids
- To provide the knowledge of molecular rearrangements

Course Outcomes:

The student will

1. be able to know the theory and principle of photochemistry
2. be able to understand about carbohydrate chemistry and classification of drug molecules.
3. be able to understand about nucleophilic, electrophilic and free radical type of molecular rearrangements and pericyclic reactions

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Paper DSE VI/Subject Name: Nanochemistry

Objective: The objective of **Nanochemistry** is to understand the fundamental concepts of nanomaterials and their application to solve various real-life problems.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl. No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the basic concept, size and synthesis of nanomaterials, and their practical importance.	BT1
CO2	**Illustrate** the structure, morphology and synthetic method of nanomaterials.	BT2
CO3	**Apply** the principle and synthetic methods for application of nanomaterials in various fields.	BT3
CO4	**Analyze** the concepts of nanomaterials and their applications to resolve scientific problems.	BT4

Subject Name: Chemistry of Biomolecules

Objective: The objective of **Chemistry of Biomolecules** is to provide the knowledge for qualitative and quantitative estimation and investigation of individual components

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Show** the importance of qualitative and quantitative analysis in modern chemistry	BT1
CO2	**Demonstrate** the chemistry of separation using chromatography and centrifugation.	BT2
CO3	**Apply** separation techniques to isolate organic biomolecules.	BT3
CO4	**Inspect** the individual components via various spectroscopic techniques.	BT4

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Subject Name: Medicinal & Pharmaceutical Chemistry

Objective: The objective of **Medicinal & Pharmaceutical Chemistry** is to provide students with a thorough understanding of the action of commonly used drugs, structure-activity relationships, different steps of pharmacokinetics and therapeutic application of various classes of drugs.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and gain the knowledge from various steps Pharmacokinetics	BT1
CO2	**Explain** the concept of the general aspects of design of drugs	BT2
CO3	**Apply** the knowledge of various common routes of drug administration in day-to-day life.	BT3
CO4	**Analyze** the adverse effects, therapeutic uses of some of the commonly used drugs.	BT4

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GUWAHATI

Programme Outcomes and Course Outcome

B.Sc Food Technology

The Assam Royal Global University

Guwahati – 35

Anuradha Deu

Director, IQAC
The Assam Royal Global University

1.1 Nature and Extent of the Programme in B.Sc. (Hons) Food Technology

The learning outcomes-based curriculum framework is based on the premise that every student and graduate is unique. Each student or graduate has his/her own characteristics in terms of previous learning levels and experiences, life experiences, learning styles and approaches to future career- 2 related actions. The quality, depth and breadth of the learning experiences made available to the students while at the higher education institutions help develop their characteristic attributes.

A bachelor's degree in Food Technology with Research is a 4 years degree course which is divided into 8 semesters as under.

SL. No	Year	Mandatory Credits to be secured for the Award
1	1st	48
2	2nd	48
3	3rd	52
Total Credits		148

i A student pursuing 4 years undergraduate programme with research in a specific discipline shall be awarded an appropriate Degree in that discipline on completion of 8th Semester if he/she secures 180 Credits. Similarly, for certificate, diploma and degree, a student needs to fulfill the associated credits. An illustration of credits requirements in relation to the type of award is illustrated below:

ii Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

iii Bachelor's Degree (Honours) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, BSc (Honours) Course in Food Technology aims to equip students to qualify for joining a profession or to provide opportunities in food processing industries. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level

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Programme Learning Outcomes relating to B.Sc (Honours) degree programme in Food Technology

Students graduating with the degree B. Sc (Food technology) will be able to achieve the following:

PO-1. Knowledge of Food Technology: Bachelor degree in Food Technology helps to apply the knowledge of science, engineering fundamentals, and mathematical concepts to the solution in the field of food technology, science and other allied subjects

PO-2. CommunicationSkills: Communicate effectively and write effective reports and design documentation, make effective presentations through seminars, project dissertations

PO-3. Critical thinking and analytical reasoning: Recognize the need for, and have the preparation and ability to engage in independent / as an entrepreneur and life- long learning in the broadest context of technological change logical reasoning and capability of recogni zing and distinguishing the various aspects of real-life problems.

PO-4. Problem Solving: Identify, formulate, review research literature, and analyze complex. Food Technology / applications problems and Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the food sustainability

PO-5. Researchrelatedskills: Acquire the practical knowledge and demonstrate the ability to design, conduct/trouble shoot experiments and analyze data in the field of food technology

PO-6. Information/digital Literacy: The completion of this programme will enable the learner to use appropriate software's to apply for bulk scale/industrial production of technology-based food product

PO-7. Self-directed learning: The student completing this program will develop an ability of working independently and to make an in-depth study of various disciplines of food technology.

PO-8. Moral and ethical awareness/reasoning: Understand the impact of the professional food technology solutions in societal and environmental contexts, and apply ethical principles and commit to professional ethics and responsibilities

PO-9. Cooperation/Teamwork: Capable of working effectively in diverse teams in both classroom and field based situations

PO-10. Lifelong learning: This programme provides self-directed learning and lifelong learning skills to think independently and develop problem solving skills with respect to food industry

B.Sc. Food Technology Programme Specific Outcomes

The programme specific outcomes of the course are-

PSO 1: Knowledge of various areas related to Food science and technology,

PSO 2: Understanding of the food composition and its physico-chemical, nutritional, microbiologicaland sensory aspects,

PSO 3: Knowledge of processing and preservation techniques of pulses, oilseeds, spices, fruits andvegetables, meat, fish, poultry, milk & milk products,

PSO 4: Relevance and significance of food safety, food quality, food plant sanitation, food laws andregulations, food engineering and packaging in food industry

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Level: Semester I

Course: C-1

Title of the Paper: Principles of Food Processing

Course Objectives

To train the students with various types of processing techniques used in food industry and to understand how processing can lead to increase in food shelf life and palatability.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**relate** the principle of food processing techniques, its function and application	**BT 1**
CO 2	**explain** the interaction of food and water, different water treatment methods and sanitation processes, role of food additives in food processing	**BT 2**
CO 3	**develop** of different types of thermal processing techniques (microwaveheating, canning, irradiation etc.), used in food Industry	**BT 3**
CO 4	**analyse** different techniques of refrigeration, freezing and drying in food processing	**BT 4**

Title of the Paper: Food Safety and Quality Management

Course Objectives

Understanding the role of various safety measurements to be taken in food industries, have the basic knowledge of safety and hygiene, its various rules and regulations.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the food hazards (physical, chemical and biological), importance of food safety and its control measures to be taken in food industry	**BT 1**
CO 2	**classify** the various food borne pathogens, basic steps in detection of foodborne pathogens and its control parameters	**BT 2**
CO 3	**apply** knowledge on different tools used for food safety and quality management	**BT 3**
CO 4	**analyze** various safety measurements to be taken in food industries.	**BT 4**

Adv

Course: C-3 **Scheme of Evaluation: (P)**

Title of the Paper: Practical on Food Processing and Food Safety

Course Objectives

Understanding the application of various laboratory equipment's used in food technology in terms of food processing and food safety

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** basic food technology laboratory equipment's, pH of the food products, moisture change analysis and heating mechanism of different food products	**BT 1**
CO 2	**classify** the various methods used for the preparation of food products(dicing, mincing, slicing, grating), freeze drying and emulsification	**BT 2**
CO 3	**construct** the HACCP Plan, ISO :22000 implementation in food industry and various sanitary methods	**BT 3**
CO 4	**survey** and report on food quality analysis and its storage , detection of adulterants in different food samples and microbiological testing	**BT 4**

AECC - 1 (1ST SEMESTER)

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**demonstrate** Communication process, verbal and non verbal communication	**BT 2**
CO 2	**understand** the skill of listening processes	**BT 2**
CO 3	**develop** a life skill on oral group communication-group discussion leadership skills, team management	**BT 3**
CO 4	**make** use of language styles-oral and written communication	**BT 3**

AECC – 2 (1st Semester)

AECC-2/Subject Name: Behavioural Science – I

Course objectives

To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**understand** self-identity and identity crisis	BT 2
CO 2	**demonstrate** self-esteem	BT 2
CO 3	**develop** in depth knowledge of foundation of individualbehavior	BT 3
CO 4	**develop** a life skill on Time management	BT 3

Level: Semester II

Course: C-1

Title of the Paper: Food Chemistry

Course Objectives

Understanding the composition of different chemicals present in foods and their relation to its taste and to gain basic knowledge on metabolic roles and functional aspects of food components.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**explain** the functions, properties, structure, classification of different metabolic pathways, browning reactions, sources and functions of dietary fibre	BT 2
CO 2	**identify** the role of food constituents, nutrients, techniques used for sensory evaluation of food	BT 3
CO 3	**apply** the knowledge on denaturation and evaluation of protein quality, metabolic pathways etc	BT 3
CO 4	**analyse** the structural and functional properties of lipids, fats and oil, its deficiencies and excess, role of vitamins and minerals and their recommended dietary allowances	BT 4

Course: C-2

Title of the Paper: Fruits and

Vegetable Products Technology

Course Objectives

To understand the processing of fruits and vegetables, maturity indices and processing of plantation crops.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**explain** the processing and preservation techniques of different fruits and vegetable products (Jam, Jelly and Marmalade)	**BT 2**
CO 2	**identify** the causes and effects of different post-harvest changes in fruits andvegetables	**BT 3**
CO 3	**apply** different pickling and dehydration processes in fruits and vegetables,their packaging and storage methods	**BT 3**
CO 4	**analyse** the processing of spices and production of different food condiments	**BT 4**

Course: C-3

Title of the Paper: Practical on Food Chemistry and Fruits and Vegetables Processing

Course Objectives

To gain knowledge about proximate analysis of food samples and their manufacturing techniques

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**find** the estimation for total protein, lipid, reducing and non-reducing sugar content in food samples	**BT 1**
CO 2	**demonstrate** the ash, moisture, gluten, iodine value determination in foodsamples	**BT 2**
CO 3	**apply** the techniques of dehydration and rehydration of fruits and vegetables and its manufacturing practices	**BT 3**
CO 4	**list** preparation methods for fruits and vegetable samples (Jam, jelly, ketchup, pickles)	**BT 4**

Adv

AECC-3 (2nd Semester)

AECC-3/Subject Name:	Communicative English- II: Conversation and Public Speaking

Course Objective:

The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**demonstrate** speaking skills	**BT 2**
CO 2	**develop** a life skill on conversation	**BT 3**
CO 3	**develop** the skill of public speaking.	**BT 3**

AECC-4 (2nd Semester)

AECC-4/Subject Name:	Behavioural Science – II

Course objectives:

To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**understand** culture and personality	**BT 2**
CO 2	**understand** Value.	**BT 2**
CO 3	**demonstrate** leadership.	**BT 2**
CO 4	**develop** a life skill on motivation	**BT 3**

Level: Semester III

Course: C-1 **Scheme of Evaluation: (T)**

Title of the Paper: Cereals, Pulses and Oilseeds Product Technology

Course Objectives

To understand the technology of milling of various cereals, processing of pulses and oilseeds. To gain knowledge on importance and processing of protein rich products and to introduce concepts of manufacturing alcoholic beverages

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the milling techniques for wheat, rice, corn, barley, oats, sorghum , millets and comparision between modern and traditional milling techniques	**BT 1**
CO 2	**explain** the processing of pulses, milling procedures and antinutritionalfactors	**BT 2**
CO 3	**apply** the knowledge of processing of oilseeds (Soyabean, Coconut), refining of fats and oil, concepts of protein isolates, their sources, properties and uses	**BT 3**
CO 4	**categorize** the alcoholic beverages and their production processes	**BT 4**

Course: C-2

Title of the Paper: Practical on Cereals, Pulses and Oilseeds Processing

Course Objectives

Application and analytical knowledge of various laboratory equipment's used in terms of bakery and cereals

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**list** the names of instruments and equipment's used in cereals, pulses and oilseeds processing	**BT 1**
CO 2	**compare** the physical dimensions of cereals, pulses and millets	**BT 2**
CO 3	**develop** malt from cereals and millets	**BT 3**
CO 4	**analyse** the proximate and cooking characteristics of wheat and rice	**BT 4**

Course: DSE-I **Scheme of Evaluation: (T)**

Title of the Paper: Food Ingredients and Additives

Course Objectives

The students should be well versed with basic knowledge of the type of food, chemistry and microbiology

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** properties of food and various ingredients	BT 1
CO 2	**explain** the role of food ingredients in food product	BT 2
CO 3	**apply** knowledge with the additives relevant to the processed food industry for shelf-life extension, processing support and sensory appeal	BT 3
CO 4	**categorize** the microbial, chemical and natural toxicants and allergens indigenously present and developed during food processing	BT 4

Course: DSE-II

Title of the Paper: Technology of Plantation Crops

Course Objectives

To understand the basic knowledge of agriculture and botany

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** basic processing of different plantation crops	BT 1
CO 2	**explain** different types of manufacturing technologies of different plantation Crops	BT 2
CO 3	**apply** knowledge of chemical and physical composition of different plantation crops	BT 3
CO 4	**categorize** the different processing methods (Cashew, Sugarcane, and Cocoa)	BT 4

Level: Semester IV

Course: C-1

Title of the Paper: Food Microbiology and Fermentation Technology

Course Objectives

To gain knowledge about genera of microorganisms associated with food and their characteristics, to understand the role of microbes in fermentation, spoilage and food borne diseases

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the types of microorganisms, their characteristics, association with food, their growth pattern and parameters	**BT 1**
CO 2	**explain** the role of microorganisms in spoilage of food and methods fortheir control	**BT 2**
CO 3	**identify** about the beneficial role of microorganisms in fermented foodproducts and their health benefits	**BT 3**
CO 4	**examine** the various food borne infections, intoxication, with their methods of isolation and cultivation	**BT 4**

Course: C-2

Title of the Paper: Practical on Food Microbiology

Course Objectives

Analysis and application of the various laboratory equipment's and the procedures used for the detection of microbes in food samples

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the basic Microbiological laboratory practices and equipment's with their functioning.	**BT 1**
CO 2	**explain** the different staining and plating techniques used for detection ofmicrobes in food samples, detailed study on morphological study on bacteria and fungi using permanent slides. preparation of various fermented food products and beverages	**BT 2**
CO 3	**identify** the quality evaluation in meat using different estimation techniques	**BT 3**
CO 4	**analyse** the quality parameters for evaluation of eggs, different methods of preservation for increasing the shelf life of eggs	**BT 4**

Course: DSE-III

Title of the Paper: Animal Products Technology

Course Objectives

The students are expected to have basic knowledge about the concepts and methods of processing and preservation of animal foods and byproduct utilization

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the compositional and technological aspects of meat and meat products	**BT 1**
CO 2	**explain** the slaughtering processes and meat quality for meat animals and poultry	**BT 2**
CO 3	**apply** the methods of processing and preservation of fish and its by products	**BT 3**
CO 4	**categorize** the egg production practices, egg preservation methods, factors affecting egg quality and measures of egg quality	**BT 4**

Course: DSE-IV

Title of the Paper: Food Analysis

Course Objectives

The students are expected to have basic idea of food analysis and improve working ability in analytical laboratory

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** fundamentals in analysis	**BT 1**
CO 2	**explain** test methods and procedures used to evaluate the quality of food	**BT 2**
CO 3	**apply** skills for laboratory management and routine analysis of water and food	**BT 3**
CO 4	**analyze** different testing methods used in food industry	**BT 4**

Level: Semester V

Course: C-1

Title of the Paper: Food Preservation Technology

Course Objectives

The students are expected to have basic knowledge about the various preservation techniques available and to make them understand the need for preservation.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the objectives and different techniques of food preservation	**BT 1**
CO 2	**explain** the various principles and methods of preservation	**BT 2**
CO 3	**apply** knowledge about the principle of evaporation, evaporators used in food industry and its mechanism	**BT 3**
CO 4	**categorize** natural and chemical preservative techniques used in food industry	**BT 4**

Course: C-2

Title of the Paper: Practical on Food Preservation Technology

Course Objectives

The students are expected to gather knowledge with the basics of laboratory techniques and instrumentation used in preservation of food.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**demonstrate** the class I and class II preservatives and their role in preservation of various food samples	**BT 2**
CO 2	**explain** the different methods of fermented food products	**BT 2**
CO 3	**apply** the techniques and methods of various food preservation	**BT 3**
CO 4	**analyse** and examine the antioxidants used in food preparation and prepare a survey report	**BT 4**

Course: DSE-V

Title of the Paper: Entrepreneurship and Management

Course Objectives

The students are expected to have basic leadership and management skills to maintain any food service and food processing units

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** entrepreneurship and its characteristics	**BT 1**
CO 2	**explain** the role and scope of entrepreneur qualities and its importance in food industry	**BT 2**
CO 3	**apply** the knowledge about purchasing and mode of purchasing in food management	**BT 3**
CO 4	**categorize** leadership qualities, its attitude and behavior	**BT 4**

Course: DSE-VI

Title of the Paper: Basic Computer Applications

Course Objectives

To familiarize students with handling of MS Office particularly for calculations, report writing and presentations.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**understand** the operations of windows operating system.	**BT 1**
CO 2	**apply** operations of MS WORD-(Editing , Formatting, inserting) in preparing project report	**BT 2**
CO 3	**apply**. operations of MS Excel for statistics and graph	**BT 3**
CO 4	**apply**. operations of MS PowerPoint for presentation	**BT 4**

Course: DSE-VII

Title of the Paper: Food Packaging Technology

Course Objectives

The students are expected to have basic knowledge about various food packaging materials used in food industry for storage and preservation

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** packaging methods and types of food packaging	**BT 1**
CO 2	**explain** the various deteriorative reactions in food, study of various factors impacting shelf life of food	**BT 2**
CO 3	apply knowledge on various packaging materials and its properties	**BT 3**
CO 4	**categorize** various packaging methods and its role in food preservation	**BT 4**

Course: DSE-VIII

Title of the Paper: Technology of Sugar Confectionery and

Course Objectives

The students are expected to have a basic idea of the status of the confectionery industry in India and to learn the technologies of confectionery products, its innovations in this sector

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the raw materials used in confectionery products and its properties	**BT 1**
CO 2	**explain** the different manufacturing techniques of different confectionery products	**BT 2**
CO 3	**apply** knowledge on sugar confectionery and its manufacturing process for different products	**BT 3**
CO 4	**categorize** the different types of chocolate and its processing techniques	**BT 4**

Level: Semester VI

Course: C-1

Title of the Paper: Concepts of Food Engineering

Course Objective:

- To acquaint with the fundamentals of food engineering and its process.
- To understand the basics of designing food plants and systems

Course Outcomes

On successful completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic laws of engineering.	**BT 1**
CO 2	**explain** heat, mass and momentum transfer	**BT 2**
CO 3	**apply** transport phenomenon in food processing operations	**BT 3**
CO 4	**solve** problems related to transport phenomenon	**BT 4**

Course: C-2

Title of the Paper: Practical on Concepts of Food Engineering

Course Objective:

- Understanding the role of instrumentation and techniques in Food Engineering and Dairy Technology.
- Understanding their importance for food industrial management

Course Outcomes

On successful completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** physical parameters	**BT 1**
CO 2	**explain** the sensory test methods and their tools and techniques	**BT 2**
CO 3	**apply** the methodologies and tools for planning of sensory analysis	**BT 3**
CO 4	**categorize** quality and non-quality products	**BT 4**

Course: DSE-IX

Title of the Paper: Food Sensory Evaluation

Course Objectives

To expose undergraduates on sensory testing of foods by providing an understanding of the senses, learn sensory techniques and sensory measurement of foods and design appropriate methods for the sensory testing.

Course Outcomes

On successful completion of the course, the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** sensory analysis and its importances	**BT 1**
CO 2	**explain** the sensory test methods and their tools and techniques	**BT 2**
CO 3	**apply** the methodologies and tools for planning of sensory analysis	**BT 3**
CO 4	**categorize** quality and non-quality products	**BT 4**

Course: DSE-X

Title of the Paper: Nutraceutical and Functional Foods

Course Objectives

The students are expected to have knowledge with biology, and basic idea of human physiology and chemistry

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the nutraceutical and functional compounds and their role in health and disease	**BT 1**
CO 2	**explain** about various phytochemicals, their sources, functions and usefulness	**BT 2**
CO 3	**apply** methods used for extraction of phytochemicals and development of functional foods	**BT 3**
CO 4	**categorize** the probiotics and prebiotics and their effects in gastrointestinal health	**BT 4**

Anuradha Das

THE ASSAM
ROYAL GLOBAL UNIVERSITY
GUWAHATI

Programme Outcomes and Course Outcome

B.Commerce

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd : 2016

Anirudha Das

Director, IQAC
The Assam Royal Global University

INTRODUCTION TO THE PROGRAMME

B.Com. (Hons.) programme of the Assam Royal Global University is devised to enable and empower students to acquire knowledge, skills and abilities to blend the contemporary realities concerning the business domain. This programme provides for maintaining and sustaining existing businesses in the face of violent winds of change and competition in the light of sustainable growth. It aims at infusing conceptual understanding to equip students to deal with business realities of today and groom them to drive and face the future challenges. The exposure of the students to the world of technology and digitization in the relevant field is also encouraged as envisaged by the scholars and policymakers. This programme is designed to foster and cultivate entrepreneurial mindset and skills besides inculcating ethical, cultural and constitutional vales

PROGRAMME OUTCOMES FOR B.COM (HONS.)

The outcomes and attributes described in qualification descriptors are attained by students through learning acquired on completion of a programme of study. The term 'programme' refers to the entire scheme of study followed by students leading to B.Com (Hons) qualification.

ProgrammelearningoutcomesforB.Com (Hons.) includes various subject specific skills, generic skills, ability enhancement skills, value addition for lifelong learning etc. The programme aims to instil creativity, critical thinking, power of scientific reasoning, ethical and constitutional values while imparting class room and field based teaching. The programme learningoutcomesofB.Com (Hons) also to enable a student to prepare for further study, employment, and good citizenship. Further, the difference in the level of achievement of programme outreach provides for comparing of learning levels and standards across different college/institution.

B. Com (Hons) Degree results in giving comprehensive knowledge of Accounting, Finance, Management, Marketing, Business and Corporate Law, Economics, Tax including various practical based courses enhancing skill in accounting software, digital marketing etc.

PO 1: Knowledge of Commerce

- Ability to attain knowledge and understanding of the areas related to finance, human resource management, marketing, international business, corporate and business laws, accounting and taxation etc

PO 2: Critical Thinking

- Ability to attain exposure to contemporary pedagogy which will enhance their understanding of real life situations by means of case-studies.

- Ability to engage in reflective and independent thinking by understanding the concepts in every area of Commerce and Business and critically evaluate and solve complex problems.

PO 3: Communication skills

- Ability to communicate long standing unsolved problems in commerce.
- Ability to listen to and read carefully various viewpoints and engage with them.
- Ability to use critical concepts and categories with clarity.
- Ability to lead group discussions.
- Ability to retain, build and transfer critical reading skills

PO 4: Cooperation/ Team Work

- Ability to inculcate teamwork, cooperation and solidarity which can be seen as a vision of the current business world full of competition.
- Ability to successfully complete projects within stipulated time.

PO 5: Research-Related Skills

- Ability to identify research gaps, formulate research questions and ascertain relevant sources to find substantive explanations.
- Ability to identify the developments in various branches of Commerce and Business

PO 6: Moral and Ethical Awareness

- Ability to interrogate one's own ethical values, and to be aware of ethical issues.
- Ability to manage self and various social systems making them responsible citizens in their conduct and business practices.

PO 7: Lifelong Learning

- Ability to understand the complexities of the business world by broadening their horizons and making them inquisitive to raise concern and act accordingly
- Ability to attain a better understanding of the dynamic world through practices of banking and investment management for personal and professional development.

PO 8: Information and Communication Technology (ICT) digital Literacy

- Ability to use various technical ICT tools (like spreadsheet) for exploring, analysis, and using the information for business purposes
- Ability to use technological aids for learning like computerised accounting system, computer applications etc.

PO 9: Problem Solving

- Ability to solve problems associated with the various business situations and real life situations like opening a bank account or operations involving internet banking.

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- Ability to enhance analytical skills and enable to comprehend solution to sustain problems originating in the diverse management areas.

PO 10: Self- directed learning

- Ability to gain perspective from various dimensionsand build thecapability to work independently in diverse projects of Commerce and Business.

Title of the Paper: FINANCIAL ACCOUNTING

Course Objective: The course aims to help learners to acquire conceptual knowledge on financial accounting, to impart skills for recording various kinds of business transactions and to prepare financial statements.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Discuss** the generally accepted accounting principles while recording and preparing financial statements, Measure business income showing the impact of various methods of depreciation and inventory valuation	**BT 2**
CO 2	**Demonstrate** profit and loss account and balance sheet of sole proprietor & partnership firms	**BT 3**
CO 3	**Execute** the preparation of branch accounts	**BT 3**
CO 4	**Execute** the preparation of departmental accounts	**BT 3**

Title of the Paper: BUSINESS ORGANIZATION

Course Objective

The course aims to familiarize the students with the world of business by providing them the basic concepts related to business and its environment, different forms of business organizations, their features and management along with the basics of entrepreneurship.

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Course Outcomes

After completing the course, the student shall be able to:		
Sl.No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the meaning of business, trade and commerce, various forms of business organisations, mergers and acquisition and entrepreneurship and the need of social obligation of businesses, Challenges and opportunities of various forms of business	**BT 2**
CO2	**Identify** the challenges of various sources of funding.	**BT 2**
CO3	**List out** the features, merits and demerits of various forms of business organisations taking practical examples	**BT 3**
CO4	**Explain** the suitability of each form of business organisations and business environment for conducting healthy business.	**BT 3**

Title of the Paper: BUSINESS LAWS

Course Objective:
The objective of the course is to impart basic knowledge of the important business laws relevant for conduct of general business activities in physical and virtual spaces along with relevant case laws.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**List** out the important provisions of Sale of Goods Act	**BT 1**
CO 2	**Examine** various aspects of entering into a legally executable contract and recognize and differentiate the special contracts and identify their appropriate usage at varied business scenarios	**BT 2**
CO 3	**Recognize** various skills to initiate entrepreneurial ventures to set up partnership and LLP firms.	**BT 2**
CO 4	**Describe** the various negotiable instruments used in business transactions and provisions of FEMA relating to external trade	**BT 2**

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AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Recognise** verbal, and non-verbal communication.	**BT 2**
CO 2	**Describe** the skill of listening processes	**BT 2**
CO 3	**Implement** life skill on oral group communication- group discussion leadership skills, team management.	**BT 3**
CO 4	**Use** of language styles – oral and written communication.	**BT 3**

AECC Paper-2/Subject Name: Behavioural Science - I

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Define** self-esteem	**BT 1**
CO 2	**Describe** self-identity and identity crisis	**BT 2**
CO 3	**Discuss** thefoundation of individual behaviour	**BT 2**
CO 4	**Experiment** the idea of time management	**BT 4**

Title of the Paper: BUSINESS ECONOMICS

Course Objective:
The course aims to provide an understanding of fundamental economic theories and their impact on market and cultivate rational approach towards economic aspects related with pricing, demand and supply. The course also aims to explain how the market and the firms respond and behave under different economic situations and systems.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Define** production function of business economics and cost concepts,	**BT 1**
CO 2	**Recognise** the elasticity of demand with respect to price and income,	**BT 2**
CO 3	**Illustrate** the application of economic theories in decision making,	**BT 3**
CO 4	**Examine** various facts of pricing under market situations	**BT 4**

Title of the Paper: BASICS OF ACCOUNTING Subject Code:COM042G102

Course Objective: The course aims to help learners coming from non-commerce background to acquire basic knowledge on financial accounting and to impart preliminary skills for recording various kinds of financial transactions.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**State** the introduction to basics of accounting and basic accounting terms	**BT 1**
CO 2	**Recognise** the preparation of journalizing, vouchers, double entry system, classification of accounts	**BT 2**
CO 3	**Discuss**the accounting for subsidiary books, bank reconciliation statement and preparation of cash book	**BT 2**
CO 4	**Demonstrate** ledger; debtors ledger, creditors ledger and general ledger.	**BT 3**

Title of the Paper: Accounting Software I

Course Objectives:

- To acquaint the student about the concept of Accounting Package
- To enable the students to understand the Tally ERP 9 Accounting Package
- To enable the Students get a hands on training in Practical Implementation of Tally ERP 9

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**State** the basics of gateway of tally, creation alteration and deletion of ledger & groups	**BT 1**
CO 2	**Pass** entries in Tally ERP 9, accounting vouchers	**BT 2**
CO 3	**Identify** stock group, stock item, stock category	**BT 2**
CO 4	**Discuss** the treatment of GST & TDS in tally	**BT 2**

Title of the Paper: CORPORATE ACCOUNTING

Course Objective:

To help the students acquire the conceptual knowledge of the corporate accounting and learn the techniques of preparing the financial statements.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Describe** accounting for share capital and debentures	**BT 2**
CO 2	**Demonstrate** financial statements and corporate annual report	**BT 3**
CO 3	**Execute** entries for right shares, bonus share and buy back of shares	**BT 3**
CO 4	**Demonstrate** accounting for amalgamation of companies with its accounting procedure	**BT 3**

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Title of the Paper: INDIAN FINANCIAL SYSTEM

Course Objectives:
The objectives of the course are to provide an understanding of the structure of Financial System and to provide an insight into the constituents of Indian financial system and its general operations.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Familiarise** with different financial instruments and services.	**BT 1**
CO 2	**Describe** the various aspects of Financial System and its operation and evolution and structure of Indian Financial System.	**BT 2**
CO 3	**Describe** the functioning of Money Market and Capital Market and financial institutions in India.	**BT 2**
CO 4	**Examine** the functioning of various regulators.	**BT 4**

Title of the Paper: CORPORATE LAW

Course Objectives:
The objectives of the course are to provide an understanding of the concept of Company, to impart basic knowledge of the provisions of the Companies Act, 2013 and Depositories Act, 1996.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Explain** the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act, 2013 and rules therein.	**BT 2**
CO 2	**Identify** the basic legal documents and their usage essential for operations and management of company.	**BT 2**
CO 3	**Explain** the company management processes, meetings, and decisions.	**BT 2**
CO 4	**Describe** the framework of dividend distribution and role of auditors in a company apart from having an insight into whistle blowing and insider trading	**BT2**

Course:AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Describe** the art ofspeaking skill.	**BT 2**
CO 2	**Identify** the types of conversation	**BT 2**
CO 3	**Execute** the art of public speaking	**BT 3**
CO4	**Demonstrate** the art of telephonic conversation and etiquettes.	**BT4**

Course:AECC-4/Subject Name: Behavioural Science - II

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** leadership.	**BT 3**
CO 2	**Describe the** process of cognitive dissonance	**BT 3**
CO 3	**Compare male** and female values.	**BT 4**
CO 4	**Relate** to the need of motivation and its effects.	**BT4**

Title of the Paper: Accounting Software-II

Course objective: An introductory course of the QuickBooks Pro accounting software, including setting up a new company and chart of accounts; recording transactions with customers, vendors and employees; managing lists; running reports and customizing them; changing forms and generating letters.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the basics of quick books,	**BT 1**
CO 2	**Describe** the process of editing & working of list	**BT 2**
CO 3	**Work** with customers and vendors using accounting software	**BT 2**
CO 4	**Examine** financial data, payroll in quick books	**BT 2**

Title of the Paper: INDIAN ECONOMY

Course Objective:
The course aims to provide an understanding of constituent sectors that define the Indian Economy and enable students to examine the role and contribution of different sections of the economy in economic development of India. The course also aims to enable the student to examine the role and impact of planning process on economic development of India.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Describe** the magnitude, size, and dimensions of Indian economy;	**BT 2**
CO 2	**Explain** how privatization and liberalization change the course and direction of Indian economy;	**BT 2**
CO 3	**Interpret** the role of population as economic resource;	**BT 3**
CO 4	**Relate** contribution of industrial development in Indian economy;	**BT4**

Title of the Paper: FINANCIAL STATEMENTS

Course Objective: The course aims to help learners coming from non-commerce background to acquire basic knowledge on financial accounting and to impart preliminary skills for recording various kinds of financial transactions.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Describe** the balancing of ledger accounts and preparation of trial balance	**BT 2**
CO 2	**Demonstrate** the concept of financial statements and its constituents	**BT 3**
CO 3	**Demonstrate** financial statement- trading profit and loss account	**BT 3**
CO 4	**Execute** the preparation of financial statement-balance sheet	**BT 3**

Title of the Paper: MANAGEMENT PRINCIPLES AND APPLICATIONS

Course Objective:
The course aims to familiarize the students with the evolution of management thoughts, various approaches to management, basic functions of management, planning premises, environmental analysis, departmentation, delegation, span of management, leadership and motivation theories.

Course Outcomes:

After completing the course, the student shall be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the various functions of management and its applicability in a business organisation and assess the ethical aspects involved in management	**BT 2**
CO 2	**Recognize** the challenges in managing organizations in the present scenario	**BT 2**
CO 3	**Describe** the importance of able leadership and role of motivation in an organization	**BT 2**
CO 4	**Differentiate** about various emerging trends in management.	**BT 4**

Title of the Paper : INCOME TAX LAW AND PRACTICE

Course Objective:
The course aims to give the learners a broad understanding of the various aspects of taxation; familiarize them with the different terms and concepts used; the various provisions relating to assessment of taxable income; and to impart knowledge to enable the learners to apply such provisions determine total income and its income tax liability. It also aims to enable learners to understand the provisions relating to filing of return of income.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the basic terminologies related to income tax.	BT 1
CO 2	**Explain** the fundamental principles of income tax law & **summarize** the structure of income tax regulations.	BT 2
CO 3	**Compute** income tax liabilities of an assessee based on applicable rates and deductions.	BT 3
CO 4	**Analyse** and assess the procedural steps involved in income tax assessment.	BT 4

Title of the Paper: BUSINESS MATHEMATICS

Course Objective: The objective of this course is to familiarize the students with the basic mathematical tools with special emphasis on applications to business and economic situations.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Use matrices as mathematical tools in representing a system of equations.	BT 3
CO 2	**Apply** differential calculus to solve simple business problems.	BT 3
CO 3	**Solve** mathematical problems related to finance.	BT 3
CO 4	**Examine** business problems involving constrained optimization	BT 4

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Title of the Paper : ADVANCED CORPORATE ACCOUNTING

Course Objectives

To equip students with knowledge of the techniques of preparing accounts and statements under various corporate situations under the Companies Act, 2013 and preparation of final accounts of various kinds of company

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Discuss** accounting related to winding up of a company	**BT 2**
CO 2	**Demonstrate** accounting entries of banking companies	**BT 3**
CO 3	**Demonstrate** accounting entries of insurance companies	**BT 3**
CO 4	**Execute** accounting for investments	**BT 3**

Title of the Paper: ENTREPRENEURSHIP & SMALL BUSINESS MANAGEMENT

Course Objective:

The course aims to enable learners to explore the concepts of entrepreneurship and its process. Impart knowledge about Industrial Parks, EDP, MSMED Act, project establishing feasibility study and institutional support required for promotion of entrepreneurships in Indian context.

Course Outcomes:

After completion of the course, students will be able to		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the concept, role and importance of entrepreneurship and generate innovative idea for business and interpret the business competence achieved by various organisations by using the innovative business model.	**BT 1**
CO 2	**Illustrate** the essentials of starting up a micro and small-scale enterprise in the changing business scenario.	**BT 3**
CO 3	**Employ** the various institutional supportive measures for the promotion of entrepreneurship in the nation/region	**BT 3**
CO 4	**Examine** the economic and operational feasibility of a proposed venture along with the impetus for venture creations.	**BT 4**

Title of the paper: Insurance and Risk Management

Course Objectives:
The objectives of the course are to develop an understanding among learners about identifying, analyzing and managing various types of risks and understand the concept of insurance as a risk management tool. Besides, the students will be able to understand principles of insurance and its usefulness in business along with its regulatory framework.

Course Outcome:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Explain** the concept of risk, its types, sources, and its management.	**BT 2**
CO 2	**Discuss** the concepts and principles of insurance and its operations.	**BT 2**
CO 3	**Explain** various types of insurance.	**BT 2**
CO 4	**Appraise** themselves about the procedure of becoming insurance agent and surveyor and acquaint themselves about their roles.	**BT 4**

Title of the Paper: PRINCIPLES OF MARKETING

Course Objectives:
The course aims to equip the learners with the basic knowledge of concepts, principles, tools, and techniques of marketing and to provide knowledge about various developments in the marketing.
Course Outcomes:

On completion of the course the students will:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the basic concepts of marketing, its philosophies and conditions affecting marketing decisions of a firm.	**BT 1**
CO 2	**Describe** the knowledge of various developments in marketing area that may govern marketing decisions of a firm.	**BT 2**
CO 3	**Use** the process of value creation through marketing decisions involving product development;	**BT 3**
CO 4	**Examine** the process of value creation through marketing decisions involving product pricing and its distribution, product promotion	**BT 4**

Title of the Paper: COMPUTER APPLICATION IN BUSINESS

Course Objectives

To provide computer fundamental skills and knowledge and to enhance the student to understand the usefulness of information technology tools for business operations.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Discuss** spreadsheet concept and spreadsheet functions	**BT 2**
CO 2	**Demonstrate** the presentation of ms power-point	**BT 3**
CO 3	**Use** the technique of ms-word processing	**BT 3**
CO 4	**Organise** business work usingspreadsheets	**BT 4**

Title of the Paper: BUSINESS STATISTICS

Course Objective:

The objectives of this paper are to impart to the students a minimum knowledge of basic statistics and its applications in business and economic problems including the ability to analyse quantitative information for decision making.

After completing the course, the student shall be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Analyze** and interpret data to assist in management decision making activities.	**BT 3**
CO 2	**Implement** rules and concepts relating to discrete and continuous random variables to answer questions within a business context.	**BT 3**
CO 3	**Use** simple/multiple regression models to analyze the underlying correlated variables.	**BT 3**
CO 4	**Examine** index numbers for economic activities and study, chronological data	**BT 4**

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Title of the paper: DIGITAL MARKETING

Course Objective: The course aims to provide knowledge about the concepts, tools, techniques, and relevance of digital marketing in the present changing scenario. It also enables the learners to learn the application of digital marketing tools and acquaint about the ethical and legal aspects involved therein.

Course Outcomes:

After completion of the course, learners will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	. **Discuss** the use of AI in Digital Marketing and demonstrate the skills in digital marketing tools such as SEO, social media, and blogging for engaging the digital generation;	**BT 2**
CO 2	**Illustrate** the measurement of effectiveness of a digital marketing campaign;	**BT 3**
CO 3	**Interpret** the impact of digital technology in transforming the business environment and also the customer journey and explain the way marketers think, conceptualize, test continuously to optimize their product search on digital platforms	**BT 3**
CO 4	**Demonstrate**the need for regulatory framework for digital marketing in India	**BT 3**

Title of the paper: ADVANCED FINANCIAL ACCOUNTING

Course Objective: The course aims to impart advanced knowledge on financial accounting applicable in business enterprises of special nature and on Government accounting system.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** Government financial administration	**BT 2**
CO 2	Use appropriate software for recording transactions and preparing accounts under Hire Purchase and Instalment Purchase system	**BT 3**
CO 3	**Use** departmental accounts in departmental stores	**BT 3**
CO 4	**Compare** commercial accounting system with Government accounting system	**BT 4**

Title of the Paper: Industrial Relations & Labour Laws

Course Objectives:

The course enables the learners to understand and apply the important concepts of industrial relations including trade unions, discipline, and various labour enactments.

Course Outcomes:

After completing the course, the learners shall be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the concept of industry, industrial relations, disputes, strikes, consequences and their settlement mechanism.	**BT 1**
CO 2	**State** the laws for employee health, safety and welfare of workers and payment of timely wages, laws relating to child employment, etc	**BT 1**
CO 3	**Identify** the importance of trade unionism in present day	**BT 2**
CO 4	**Examine** the role of industry regulators in implementing various laws to maintain industrial peace and worker's upliftment.	**BT 4**

Title of the paper: Foreign Exchange Management

Course Objectives:

The objectives of the course are to develop an understanding among learners about foreign exchange and transactions in foreign exchange market.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Explain** the legal environment relating to foreign exchange dealings in India.	**BT 2**
CO 2	**Explain** the concept of foreign exchange market and exchange rate.	**BT 2**
CO 3	**Illustrate** transactions in foreign exchange.	**BT 3**
CO 4	**Appraise** themselves about the exchange risks and learn how to manage exchange risk	**BT 4**

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Title of the paper: HUMAN RESOURCE MANAGEMENT

Course Objective:
The course aims to familiarize the students with various facets of managing people in an organization by imparting knowledge about from the stage of recruitment to development and to acquaint students with the techniques and principles to manage HR of an organization.

Course Outcomes:

After completing the course, the learners shall be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the concept of Human Resource Management and its various functions.	BT 1
CO 2	**Explain** the importance and challenges of human resource management in today's working environment	BT 2
CO 3	**Identify** the concept of Compensation Management and its approaches	BT 3
CO 4	**Examine** the modern trends and approaches in HRM and the different aspects of employee welfare	BT 4

Title of the paper: Financial Management

Course Objectives:
The course aims to provide an understanding of the concept of finance and how influential the time value of money is. It further familiarizes the learners with various principles and practices of financial management while apprising them with the various decisions involved in managing finance.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the nature and scope of financial management	BT 1
CO 2	**Explain** various capital structure theories and analyze factors	BT 2
CO 3	**Demonstrate** the various sources of finance in today's competitive industry	BT 3
CO 4	**Analyze** capital budgeting process and apply capital budgeting techniques for business decisions	BT 4

Title of the paper: Banking Law and Practice

Course Objectives:
The objectives of the course are to provide an understanding of the concept of bank and to provide an insight into the functioning of banks.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Define** the banking structure in India and the law relating to banks	**BT 1**
CO 2	**Interpret** the banker customer relationship	**BT 2**
CO 3	**Identify** themselves of the activities of paying and collecting banker	**BT 3**
CO 4	**Analyze** the insights on lending operations of banking and causes of NPA into banking sector.	**BT 4**

Title of the paper: Services Marketing

Course Objective
The course aims to familiarize the students with the concept of service marketing management, its tools, facets and forms along with understanding of the emerging trends in service industry. The legal and ethical aspects, factors impeding growth of modern services sector will also be dealt with.

Course Outcomes

After completing the course, the student shall be able to:		
Sl.No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the meaning of services, goods vs services, characteristics of services, evolutionary stages of service marketing, Challenges of service marketing, Ethical aspects in Service Marketing and Future of Service industry in India, the basic theoretical framework of service	**BT 1**
CO2	**Explain** the strategies of product, price, place, promotion, people, process and physical evidence and also identify the importance of various models to tangibilize services in the present scenario	**BT 2**
CO3	**Identify** the various gaps in services and techniques to resolve it taking practical examples and also list the obligations of service marketers towards society under ethical and legal dimensions.	**BT 3**
CO4	**Examine** the suitability of services sector in various forms of service in global service scenario	**BT 4**

Title of the Paper: Financial Statement Analysis

Course Objectives

To equip the learners to analyze accounting and other information incorporated in the corporate annual reports, to analyze operating, financial, and structural performance of business firms with the help of appropriate analytical tools.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Recall** the components of financial statements and financial statement analysis.	BT 1
CO 2	**Interpret** financial statements in evaluating various aspects of a company's operations, profitability, and financial position.	BT 2
CO 3	**Apply** financial statement analysis techniques to assess the liquidity, profitability, and solvency of a company.	BT 3
CO 4	**Analyze** financial statements to identify trends, patterns, and anomalies that may signal financial strengths or weaknesses.	BT 4

Title of the paper: Project Report

Course Objectives:

1. The course aims to inculcate research aptitude among the learners and to enable them to prepare project report based on empirical data.

2. To make the students do researches in their field of interest.

3. To make the students gain practical knowledge about preparing thesis by using different methodologies for doing research work.

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Title of the Paper-Indirect Taxation

Course Objectives:

The course aims to provide understanding about salient features of GST law and implications of its various provisions for different classes of suppliers. It also aims to provide an understanding of compliances and procedures laid down in GST law and to provide the understanding about significant provisions of the customs law.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** key concepts related to indirect taxes such as GST and customs duty	**BT 1**
CO 2	**Interpret** indirect tax laws and regulations to determine the tax implications for businesses.	**BT 2**
CO 3	**Apply** knowledge of GST laws to calculate tax liabilities for businesses based on transactions and activities.	**BT 3**
CO 4	**Analyze** GST Laws with reference to relevant, exemptions, relief or incentives	**BT 3**

Title of the paper: Financial Services

Course Objectives:

The objectives of the course are to get a proper understanding about financial services and to familiarize the students with the growing and innovative financial services in the economy.

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Recall** the concept and importance of financial services.	**BT 1**
CO 2	**Illustrate** various fee based traditional as well as innovative financial services	**BT 2**
CO 3	**Identify** mutual funds schemes and investment mechanism.	**BT 3**
CO 4	**Analyse** lease financing and venture capital.	**BT 4**

Title of the paper: Investment in Stock Market

Course Objective:

The objective of the course is to provide the students with a conceptual understanding of stock market.

Pre-requisite: Basic Knowledge of economics and financial market.

Course Outcomes:

On completion of this course students will be able to:		
Sl No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Learn** the basics of investing.	BT 1
CO 2	**Understand** stock market as an investment destination.	BT 2
CO 3	**Apply** the knowledge of Stock Market Trading Mechanism	BT 3
CO 4	**Analyse** securities before investing	BT 4

Title of the Paper: Auditing

Course Objectives

To equip the learners with the basic concepts of auditing, concepts of internal control, internal check and audit evidence, process of vouching and verification and the special areas of audit & process of audit of companies.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** the basic concept of auditing	BT 1
CO 2	**Demonstrate** the process of auditing	BT 2
CO 3	**Make use** of standards of auditing in the verification of financial statements	BT 3
CO 4	**Analyze** the various errors and frauds that takes place in a business	BT 4

Title of the Paper: COST ACCOUNTING

Course Objectives:

The objectives of the course are to provide an in-depth understanding of the conceptual framework of cost accounting principles and ascertainment of cost in different industries using different methods.

Course Outcomes:

On completion of this course students will be able to:		
Sl No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	**Recall** basic cost accounting terminologies.	BT 1
CO 2	**Explain** the objectives and importance of cost accounting in managerial decision-making.	BT 2
CO 3	**Apply** overhead allocation methods to allocate indirect costs to cost objects.	BT 3
CO 4	**Analyze** cost behavior patterns.	BT 4

Title of the Paper: Management Accounting

Course Objectives:

The course aims to impart the learners, knowledge about the use of financial, cost and other data/information for the purpose of managerial planning, control and decision making.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** basic concepts and principles of management accounting	BT 1
CO 2	**Explain** the role of management accounting in decision-making within organizations.	BT 2
CO 3	**Utilize** budgeting and variance analysis techniques to monitor and control costs within organizations.	BT 3
CO 4	**Analyze** cost-volume-profit relationships to assess the impact of changes in sales volume, selling prices, or costs on profitability	BT 4

Title of the paper: Portfolio Management

Course Objectives:

The objectives of the course are to make students aware about the basics of investment and portfolio management, models of portfolio analysis, concept of portfolio evaluation and portfolio revision.

Prerequisites: Basic concepts of Finance

Course Outcomes:

On completion of this course students will be able to:		
SL No	**Course Outcomes:**	**Blooms Taxonomy Level**
CO 1	Define investment and its principles as well as recognise the steps in construction of portfolio	**BT 1**
CO 2	Illustrate investment risks and stock analysis approaches.	**BT 2**
CO 3	Illustrate Portfolio revision and Evaluation	**BT 3**
CO 4	Analyze and select optimum Portfolio	**BT 4**

Title of the Paper: Customer Relationship & Advertising

Course Objective

The course aims to familiarize the students with the need of maintaining customer relationship, its importance in success of business, role of CRM in various industries, basics of advertising and personal selling as promotional tools in marketing and to develop a customer oriented attitude for designing advertising and personal selling messages.

Course Outcomes

After completing the course, the student shall be able to:		
Sl.No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** CRM Architecture process of implementing CRM, steps for successful implementation of CRM, e CRM -its importance and drawbacks	**BT 1**
CO2	**Explain** the role of market survey in customer satisfaction, CRM usage in various sectors and customer retention and acquisition strategies	**BT 2**
CO3	**Develop** the various Information Response Hierarchy Models and its application taking practical examples.	**BT 3**
CO4	**Analyse** the role of advertising budget, and Institutional Framework. Role of Advertising Standards Council of India for increasing advertising effectiveness. Also explain the ethical and legal aspects of advertising	**BT 4**

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GUWAHATI

Programme Outcomes and Course Outcome

B.Sc-Mathematics

The Assam Royal Global University

Guwahati – 35

Anuradha Dev

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The Assam Royal Global University

Nature and extent of the B.Sc. (Hons.) Mathematics

Mathematics is the study of quantity (number theory), structure (algebra), space (geometry) and change (mathematical analysis). It has wide range of applications in natural sciences, engineering, economics, social sciences and even bio and medical sciences. The key areas of study in mathematics are:

I. Real & Complex analysis
II. Calculus
III. Abstract Algebra
IV. Number Theory
V. Graph Theory
VI. Differential Equations (including Mathematical Modelling)
VII. Linear Algebra
VIII. Metric Spaces and Topology
IX. Numerical Analysis
X. Mechanics

To broaden the interest for interconnectedness between formerly separate disciplines one can choose from the list of Generic electives for example one can opt for economics, physics, chemistry or any other subject of interest offered by different departments and schools of the Assam Royal Global University as one of the GE papers. Skill enhancement Courses enable the student acquire the skill relevant to the main subject. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Communication English and Behavioural Science are compulsory papers for students of B.Sc. (H) in Mathematics which enable them to be better communicator and develop better personality.

As a part of effort to enhance employability of mathematics graduates, the well- structured programme empowers the students with the skills and knowledge leading to enhance career opportunities in various sectors of human activities.

6.1 Programme Outcomes

PO1: Knowledge of Mathematics:

Ability of demonstrating comprehensive knowledge of mathematics and its subfields, and its applications to one or more disciplines.

PO2: Communications skills:

Capability to express various concepts of mathematics in effective and coherent manner using examples and visualizing their geometrical meaning both in writing and speaking; ability to present the complex mathematical ideas in clear, precise and confident way; ability to explain the development and importance of mathematics in various scientific developments; capability to communicate thoughts and views in mathematically or logically correct statements.

PO3: Critical thinking

i) Ability to employ mathematical foundations, critical thinking in understanding the concepts in every area of mathematics and allied areas.

ii) Capability to formulate mathematically correct arguments

PO4: Analytical thinking:

Ability to analyze the results and apply them in relevant various problems appearing in different branches of mathematics.

PO5: Problem solving:

Capacity to use the earned knowledge to solve different non-familiar problems and apply the learning to real world situations; capability to solve problems in computer graphics using concepts of linear algebra; Capability to apply the acquired knowledge in differential equations to solve specific problems in other disciplines.

PO6: Research-related skills:

i) Potentiality to think and inquire about relevant/appropriate questions, ability to define problems, formulate and test hypotheses, formulate mathematical arguments and proofs, draw conclusions; ability to write the obtained results clearly.

ii) To know about the developments in various branches of mathematics.

PO7: Information Literacy/ Digital literacy:

- Ability to use ICT and other online tools in solving problems or earning knowledge.
- Capacity to use appropriate software and programming skills to solve problems in mathematics.

PO8: Self-directed learning

Potentiality to work independently and do in-depth study of various concepts of mathematics., ability to search relevant resources and e- resources for self-learning and amplifying knowledge in mathematics.

PO9: Moral and ethical Learning

Ability to identify unethical behaviour such as fabrication or misrepresentation of data, committing plagiarism, infringement of intellectual property rights and adopting objective, unbiased and truthful actions in all aspects.

PO10: Life Long Learning

Ability to earn knowledge and skills through self-learning that helps in personal development as well as skill development to make them suitable for changing demands of work place.

6.2. Programme Specific Outcomes

PSO-1: Enable a student to be better and effective communicator of mathematics by written, computational and graphical means.

PSO-2: Ability to illustrate mathematical ideas from basic theorems and axioms.

PSO-3: Ability to apply mathematics to solve, analyze theoretical problems of mathematics.

PSO-4: Enable a student to identify applications of mathematics in other disciplines and in the real-world, leading to enhancement of career prospects in a relevant fields and research.

SYLLABUS (1ST SEMESTER)

Subject Name: Calculus (Differential & Integral)		Subject Code: MAT012C101
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Calculus (MAT02C101)** is to impart the fundamental concepts of calculus and to explain various real-life problems which can be solved by using calculus.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different methods of finding higher order differential and integral calculus of various functions.	BT1
CO2	**Illustrate** various methods to find higher order differentiation and integration of various functions.	BT2
CO3	**Apply** differentiation to find extreme values of functions, Jacobian, physical properties of various transformations.	BT3
CO4	**Analyze** concepts of differential calculus and integral calculus theories and their applications to scientific problems.	BT4

SYLLABUS (1ST SEMESTER)

Subject Name: Classical Algebra and Trigonometry		Subject Code: MAT012C102
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Classical Algebra and Trigonometry (MAT012C102)** is to impart the fundamental concepts of classical algebra and trigonometry and to apply the results of classical algebra and trigonometry to any other field of mathematics for higher study.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** concept of classical and trigonometry.	BT1
CO2	**Understand** inequalities and different inequality theorems.	BT2
CO3	**Solve** different types of algebraic equations.	BT3
CO4	**Analyze** various aspects of trigonometric and logarithm functions.	BT4

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SYLLABUS (1st SEMESTER)

Subject Name: Differential Equations (ODE & PDE)		**Subject Code: MAT012C103**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objectives: The objective of **Differential Equations (MAT012C103)** is to introduce the fundamental concepts of ordinary and partial differential equations and to explain the methods to solve such equations.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the first order differential equations and learn to solve first order differential equations by using different standard methods.	BT1
CO2	**Understand** the second order linear differential equations and able to apply the methods to solve such equations.	BT2
CO3	**Apply** different standard methods to solve first order linear and non-linear partial differential equations.	BT3
CO4	**Analyze** second order partial differential equations and find it's solution by standard methods.	BT4

SEC-1 (1st Semester)

Subject Name: Mathematics for Competitive Examinations		**Subject Code: MAT012S101**
L-T-P-C: 2-0-0-2	**Credit Units: 2**	**Scheme of Evaluation: T**

Objective: The objective of **Mathematics for Competitive Examinations (MAT012S101)** is to impart the problem quantitatively and use appropriate arithmetical methods to solve the problem and to prepare the students for competitive examinations.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the basic calculations for competitive examinations.	BT1
CO2	**Illustrate** the uses of ratio and proportions in complicated problems.	BT2
CO3	**Apply** the number system in various problems in the competitive examinations.	BT3
CO4	**Examine** different problem solving technique in the competitive examinations.	BT4

SYLLABUS (1ST SEMESTER)

Subject Name: Mathematics-I		Subject Code: MAT012G101
L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: T

Objective: The objective of **Mathematics-I (MAT012G101)** is to develop fundamental concepts of differential calculus and integral calculus.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** higher order calculus, sequence and series and trigonometry.	BT1
CO2	**Understand** the method to find derivatives, integration, convergence of sequence and theories of trigonometry.	BT2
CO3	**Apply** sequence and series and capability to check convergence.	BT3
CO4	**Analyze** the concept of calculus and De Moivre's theorem.	BT4

SYLLABUS (Generic II)

Subject Name: Fundamentals of Mathematics		Subject Code: MAT012G102
L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: T

Objective: The objective of **Foundation of Mathematics (MAT012G102)** is to develop the fundamental concept of linear equation, calculus and Laplace's transform.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the definitions and formulae of linear algebra, calculus and Laplace transformation.	BT1
CO2	**Understand** the theories of linear algebra, calculus and Laplace transformation.	BT2
CO3	**Apply** the theories of linear algebra, calculus and Laplace transformation to solve related problems.	BT3
CO4	**Analyze** the theories of linear algebra, calculus and Laplace transformation.	BT4

SYLLABUS (2nd SEMESTER)

Subject Name: Vector Analysis and Linear Algebra		Subject Code: MAT012C201
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objective of **Vector Analysis and Linear Algebra (MAT012C201)** is to provide the fundamentals & concept of vector algebra, vector calculus and matrix algebra.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Remember** the definitions and formulae of vector calculus and linear algebra.,	BT1
CO2	**Understand** the theories of vector analysis and linear algebra.	BT2
CO3	**Apply** the theories of vector analysis and linear algebra to solve related problems.	BT3
CO4	**Analyze** the theories of vector analysis and linear algebra with examples.	BT4

SYLLABUS (2nd SEMESTER)

Subject Name: Analytical Geometry		Subject Code: MAT012C202
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Analytical Geometry (MAT012C202)** is to impart fundamental laws and formulas of coordinate geometry and to demonstrate the algebraic methods to study geometry and to make graphical representations of algebraic equations.

Prerequisites:

- Basic concepts (absolute value, graphing, distance formula), inclination and slope of a line, division of a line segment, analytic proofs of geometric theorems, relations, and functions.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the definitions and formulae of two- and three-dimensional geometry.	BT1
CO2	**Understand** the equation and geometry of two- and three-dimensional coordinate system.	BT2
CO3	**Apply** the theories of two- and three-dimensional coordinate geometry to solve related problems.	BT3
CO4	**Analyze** two- and three-dimensional coordinate geometry to sketch different geometrical shapes.	BT4

SYLLABUS (2st SEMESTER)

Subject Name: Introduction to Data Science		**Subject Code: MAT012C203**
L-T-P-C: 2-0-4-4	**Credit Units: 3**	**Scheme of Evaluation: TP**

Objective: The objective of the course **Introduction to Data Science (MAT01C203)** is to impart the knowledge of data collection and to enable applying multiple techniques (summary statistics, tables, graphics) to handling univariate data using basic hands-on program with MS-EXCEL and TABLEAU.

Course Outcome:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** raw data efficiently.	BT1
CO2	**Classify** different types of data.	BT2
CO3	**Apply** Handle Excel and Tableau for handling data.	BT3
CO4	**Analyse** different types of data.	BT4

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SYLLABUS (2st SEMESTER)

Subject name: Introduction to R (SEC-2)		**Subject Code: MAT012S201**
L-T-P-C – 1-0-2-2	**Credit Units: 2**	**Scheme of Evaluation: (TP)**

Course objectives:

The objective of the course **Introduction to R (MAT012S121)** is to impart statistical tool R for for analysis of data.

Course Outcome:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** basics of coding in R.	BT1
CO2	**Demonstrate** different objects of R.	BT2
CO3	**Apply** different operators used in R.	BT3
CO4	**Analyze** different types of data through R.	BT4

SYLLABUS (2nd SEMESTER)

Subject Name: Mathematics-II		**Subject Code: MAT012G201**
L-T-P-C: 3-0-0-3	**Credit Units: 3**	**Scheme of Evaluation: T**

Objective: The objective of **Mathematics-II (MAT012G201)** is to impart the concept of linear equations, differential equations, vector analysis and coordinate geometry.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** first order differential equation, coordinate geometry, linear algebra and vector analysis.	BT1
CO2	**Understand** the method to solve problems of differential equation, coordinate geometry, linear algebra and vector analysis.	BT2
CO3	**Apply** differential equation, coordinate geometry, linear algebra and vector analysis to solve related problems.	BT3
CO4	**Analyze** the concept of differential equation, coordinate geometry, linear algebra and vector analysis.	BT4

SYLLABUS (Generic II)

Subject Name: **Aptitude and Quantitative Ability**		Subject Code: **MAT012G202**
L-T-P-C: 3-0-0-3	**Credit Units 3**	**Scheme of Evaluation: T**

Objective: The objectives of **Aptitude and Quantitative Ability (MAT012G104)** is to impart the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem to prepare the students for competitive examinations.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Choose** calculations technique to solve problems of competitive examinations.	BT1
CO2	**Explain** the logical reasoning.	BT2
CO3	**Apply** short cut technique to save time in solving problems.	BT3
CO4	**Compare** different data handling technique.	BT4

SYLLABUS (3rd SEMESTER)

Subject Name: Real Analysis-I		**Subject Code: MAT012C301**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objective of **Real Analysis (MAT012C301)** is to develop independent thinking and problem-solving skills in various analytical properties of the real number system.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the definitions and formulae of Real analysis.	BT1
CO2	**Understand** the theories of Real analysis.	BT2
CO3	**Apply** the theories of Real analysis to solve related problems.	BT3
CO4	**Analyze** the theories of Real analysis with examples.	BT4

SYLLABUS (3rd SEMESTER)

Subject Name: Mechanics-I		Subject Code: MAT012C302
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Mechanics-I (MAT012C302)** is to impart the principles of static equilibrium to particles and rigid bodies.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** terms related to statics and dynamics.	BT1
CO2	**Understand** the laws different laws of statics and dynamics.	BT2
CO3	**Apply** different laws of statics and dynamics to solve related problems	BT3
CO4	**Examine** theories of statics and dynamics to solve real field problems.	BT4

SYLLABUS (3rd SEMESTER)

Subject Name: Ordinary Differential Equations		Subject Code: MAT012D301
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objective of **Ordinary Differential Equations (MAT012D301)** is to understand different forms of first ordinary differential equations, their solution methods and application to physical problems.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different terms and definitions related to ordinary differential equations and identify different solution methods for ODE.	BT1
CO2	**Understand** the different methos of first and higher order differential equations.	BT2
CO3	**Apply** different methods to solve related problems of ordinary differential equations.	BT3
CO4	**Analyze** the solution of differential equations relating to physical or real-life problems.	BT4

SYLLABUS (3rd SEMESTER)

Subject Name: Business Mathematics		Subject Code: MAT012D302
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: TP

Objective: The objective of the course **Business Mathematics (MAT01D302)** is to impart the concept of commercial and financial mathematics.

Course Outcome:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** different mathematical terms related to commercial and financial mathematics.	BT1
CO2	**Understand** the concept of commercial arithmetic and finance.	BT2
CO3	**Apply** the concept of commercial arithmetic and finance to solve related problems.	BT3
CO4	**Analyze** the different problems of business and economics through the commercial arithmetic and mathematics of finance	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Abstract Algebra		Subject Code: MAT012C401
L-T-P-C: 3-2-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Abstract Algebra (MAT012C401)** is to provide the concept of algebraic structures and their applications.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the definitions and formulae of Abstract Algebra.	BT1
CO2	**Understand** the theories of Abstract Algebra.	BT2
CO3	**Apply** the theories of Abstract Algebra.to solve related problems.	BT3
CO4	**Examine** the theories of Abstract Algebra with examples.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Complex Analysis		**Subject Code: MAT012C402**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objective of **Complex Analysis (MAT012C402)** is to provide the fundamental concepts of complex analysis.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the different terms of complex number system.	BT1
CO2	**Understand** the theories of complex analysis.	BT2
CO3	**Apply** the theories of complex analysis to solve related problems.	BT3
CO4	**Analyze** different theories of complex analysis.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Partial Differential Equations		**Subject Code: MAT012D401**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objective of **Partial Differential Equations (MAT012C301)** is to develop the concepts of different forms of partial differential equations, their solution methods and application to physical problems.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different terms and definitions related to partial differential equations and identify different solution methods for PDE.	BT1
CO2	**Understand** the different methos of first and higher order partial differential equations.	BT2
CO3	**Apply** tdifferent methods to solve related problems of partial differential equations.	BT3
CO4	**Analyse** the solution of partial differential equations relating to physical or real-life problems.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Mechanics-II		Subject Code: MAT012D402
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Mechanics-II (MAT012D402)** is to impart the principles of static equilibrium to particles and rigid bodies.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the terms related to rigid dynamics.	BT1
CO2	**Understand** the motion of the centre of inertia.	BT2
CO3	**Apply** different laws of rigid dynamics to solve related problems	BT3
CO4	**Examine** theories of rigid dynamics to solve real field problems.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Introduction to Mathematical Modelling		Subject Code: MAT012D402
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The main objective of **Introduction to mathematical modelling (MAT012D402)** is to impart fundamental techniques of mathematical modelling and applications.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the terms required for mathematical modeling process.	BT1
CO2	**Understand** the concept and theories of Mathematical modeling.	BT2
CO3	**Apply** the different mathematical modeling techniques.	BT3
CO4	**Analyse** well-known mathematical models of real-world problems.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: SEC3 (Mathematical programming tools)		Subject Code: MAT012S401
L-T-P-C: 0-0-4-2	Credit Units: 2	Scheme of Evaluation: P

Course Objectives:

The objective of **SEC3 (Mathematical programming tools) (MAT012S401)** is to familiarize students with the usage of mathematical software (Mathematica/MATLAB/Maxima/Maple).

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** basic terms relating to Mathematica/MATLAB/Maxima/Maple	BT1
CO2	**Demonstrate** different functions using codes of Mathematica/MATLAB/Maxima/Maple	BT2
CO3	**Apply** different codes of Mathematica/MATLAB/Maxima/Maple to find outputs.	BT3
CO4	**Compare** and conclude the output obtained by using Mathematica/MATLAB/ Maxima/ Maple.	BT4

SYLLABUS (4th SEMESTER)

Subject Name: Mathematics-IV		Subject Code: MAT012G401
L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: T

Objectives: The objective of **Mathematics-IV (MAT012G401)** is to impart the concept of Probability, Analytic functions and numerical analysis.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** different terms of probability, analytic function and numerical analysis.	BT1
CO2	**Understand** the different terms and rules of probability, analytic function and numerical analysis.	BT2
CO3	**Apply** the theories to solve related problems of probability, analytic function and numerical analysis.	BT3
CO4	**Analyse** the theory of probability, analytic function and numerical analysis in some real-life problems.	BT4

SYLLABUS (5th SEMESTER)

Subject Name: Numerical Methods		Subject Code: MAT012C501
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The general objectives of the course **Numerical Methods (MAT012C501)** are to enable students solving algebraic, transcendental equations, numerical solutions of differential equation and Optimization Techniques.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**List** different types of error occurred in numerical analysis.	BT1
CO2	**Understand** the differences and difference formulas used to evaluate and approximate a function.	BT2
CO3	**Apply** appropriate numerical method to solve algebraic or transcendental equation.	BT3
CO4	**Analyze** the solution of first order differential equation obtained by numerical integration.	BT4

SYLLABUS (5th SEMESTER)

Subject Name: Number Theory and Graph theory		Subject Code: MAT012C502
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Number Theory and Graph Theory (MAT012C502)** is to develop the basic understanding and problem-solving skills in Number Theory and Graph theory.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the definitions and properties of Well-ordering principle, Archimedean property, division algorithm, GCD and LCM, Euclidean algorithm and prime numbers.	BT1
CO2	**Understand** the theory of Congruence	BT2
CO3	**Apply** the theories and properties of various Graphs to solve related problems.	BT3
CO4	**Analyze** the theories of Trees and connectivity with examples.	BT4

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SYLLABUS (5th SEMESTER)

Subject Name: Advanced Linear Algebra **Subject Code: MAT012D501**

L-T-P-C: 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The objectives of **Advanced Linear Algebra (MAT012D501)** is to impart various methods to solve system of linear equations and to learn fundamental concepts vector spaces and linear mapping on vector spaces.

Course Outcomes:

After successful completion of the course, student will be able to

Sl No	Course Outcome	Bloom's Taxonomy Level
CO1	**Recall** the rank of a matric and solution of system of linear equations.	BT1
CO2	**Understand** the properties of eigenvalues, eigenvectors and linear mapping	BT2
CO3	**Apply** the theories of eigenvalues, eigenvectors and linear mapping	BT3
CO4	**Examine** the theories of bases, dimension and its application	BT4

SYLLABUS (5th SEMESTER)

Subject Name: Hydrostatics **Subject Code: MAT012D502**

L-T-P-C: 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objectives: The objectives of **Hydrostatics (MAT012D502)** are to develop fundamental understanding about hydrostatic law, principle of buoyancy and stability of a floating body for analysis of static fluids.

Course Outcomes:

After successful completion of the course, student will be able to

Sl No	Course Outcome	Bloom's Taxonomy Level
CO1	**Define** the terms related with hydrostatics and the involved equations and laws.	BT1
CO2	**Understand** the basic laws of hydrostatics, principle of buoyancy and stability of a floating body.	BT2
CO3	**Apply** basic laws and equations of hydrostatics to solve related problems.	BT3
CO4	**Analyze** stability of a floating body for static fluids.	BT4

SYLLABUS (5th SEMESTER)

Subject Name: Transform Calculus (Laplace and Fourier) **Subject Code: MAT012D503**

L-T-P-C: 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The objectives of **Fourier Series and Transform Calculus (MAT012D503)** is to provide exposure to solution of ordinary and partial differential equations of initial and boundary value problems by Laplace and Fourier transform methods.

Course Outcomes:

After successful completion of the course, student will be able to

Sl No	Course Outcome	Bloom's Taxonomy Level
CO1	**Define** Laplace transforms, Inverse Laplace Transform, and its properties.	BT1
CO2	**Understand** about Fourier transform and its properties.	BT2
CO3	**Apply** the theories of Fourier Transform to understand Fourier Series.	BT3
CO4	**Analyse** the theory of Laplace and Fourier Transforms to solve initial and boundary value problems.	BT4

SYLLABUS (5th SEMESTER)

Subject Name: Hydrodynamics and Tensor Calculus **Subject Code: MAT012D504**

L-T-P-C: 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objectives: The objectives of the course **Hydrodynamics and Tensor Calculus (MAT012D504)** are to develop basic concepts of fundamental laws of hydrodynamics and Tensor Calculus and to develop problem-solving skills to solve related problems.

Course Outcomes:

After successful completion of the course, student will be able to

Sl No	Course Outcome	Bloom's Taxonomy Level
CO1	**Define** the terms related with hydrodynamics and tensor calculus.	BT1
CO2	**Understand** the basic laws of hydrodynamics and the laws and properties related with tensor calculus.	BT2
CO3	**Apply** basic laws and properties of hydrodynamics and tensor to solve related problems.	BT3
CO4	**Analyze** the equation of motion for hydrodynamic problems.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Advanced Calculus		**Subject Code: MAT012C601**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objectives of **Advanced Calculus (MAT012C601)** to develop independent thinking in various analytical properties of the advance real number system.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** sequence and different comparison tests.	BT1
CO2	**Understand** the theory of Continuity and Differentiability.	BT2
CO3	**Apply** the theories to find out maxima and minima of functions of two variables.	BT3
CO4	**Analyse** Change of order of integration in double integrals.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Metric Space and Topology		**Subject Code: MAT012C602**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The aim of the course **Metric Space and Topology (MAT012C602)** is to introduce the concepts and to explain the fundamental theory of metric and topological spaces, to enable learning the basic notions of metric and topological spaces and to impart the properties of continuous mappings.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and understand the concept of metric spaces.	BT1
CO2	**Understand** the concept of sequences in metric spaces.	BT2
CO3	**Apply** the concept of continuity, compactness and connectedness in metric spaces to solve related problems.	BT3
CO4	**Analyze** the concept of topological spaces.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Mathematical Logic & Combinatorics		Subject Code: MAT012D601
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Combinatorics & Mathematical Logic (MAT012D601)** is to formulate problems in the language of formal system, to use concept of mathematical logic in inference theory and to study basic idea of counting principle.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** basic connectives and formal system of statement calculus	BT1
CO2	**Understand** the basic concept of mathematical logic and combinatorics	BT2
CO3	**Apply** idea of mathematical logic and combinatorics to solve problems.	BT3
CO4	**Examine** theories of mathematical logic and combinatorics to solve problems of other branches.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Real Analysis-II		Subject Code: MAT012D602
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Real Analysis-II (MAT012D602)** is to understand the underlying concept of differentiability and its applications, the integration of bounded functions on a closed and bounded interval, the sequence and series of real valued functions, an important class of series of functions and to develop independent thinking and problem-solving skills.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl. No.	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** and understand concepts of differentiability and its applications.	BT1
CO2	**Understand** concepts of differentiability and Taylor's theorem.	BT2
CO3	**Apply** the concept of Riemann integration.	BT3
CO4	**Analyze** the concept of sequences and series of functions.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Spherical Trigonometry and Astronomy	Subject Code: MAT012D603	
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Spherical Trigonometry and Astronomy (MAT012D603)** are to provide the concept of trigonometry on spherical coordinate system, introduce the application of spherical trigonometry in astronomy, and enable learning Kepler's laws of planetary motion and its applications.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** spherical trigonometry, terrestrial sphere and celestial sphere.	BT1
CO2	**Understand** spherical trigonometry concept and position of heavenly bodies in terrestrial sphere and celestial sphere.	BT2
CO3	**Apply** the theories of spherical trigonometry to study Astronomy.	BT3
CO4	**Analyse** the theory of Astronomy, Kepler's planetary motion.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Data Analysis and Lab (Python)	Subject Code: MAT012D604	
L-T-P-C: 3-0-1-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The general objectives of the course **Data Analysis and Lab (Python) (MAT012D604)** are to enable learning basics of Python, handling Python for data wrangling, data analyzing and data prediction using Python.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Memorize** Python Basics, Data types and variables, Operators and operator precedence, Data type conversions, Control statements	BT1
CO2	**Discuss** Preparation of Datasets, Exploratory Data Analysis, Filtering and hierarchical indexing using Pandas.	BT2
CO3	**Apply** Python for Descriptive and Inferential Statistics.	BT3
CO4	**Analyze** data using machine learning techniques.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Linear Programming Problem (LPP)		**Subject Code: MAT012D605**
L-T-P-C: 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objective of **Linear Programming Problem (MAT012D605)** is to impart the fundamental concepts and application of Linear Programming Problem in real-life problems.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different types of Linear Programming Problem.	BT1
CO2	**Explain** the methods of solution of different types of LPP	BT2
CO3	**Apply** the methods of solution to solve using simplex method, transportation, Assignment and game theory problems	BT3
CO4	**Analyse** the different cases that can arise during solution process such as concept of degeneracy, alternate Optima, infeasibility and boundedness of the solution.	BT4

SYLLABUS (6th SEMESTER)

Subject Name: Random Processes		**Subject Code: MAT012D606 L-T-P-C: 3-1-0-4**
Credit:4		**Scheme of Evaluation: T**

Objective: The objectives of **Random Processes (MAT012D606)** is to provide necessary basic concepts in probability and random processes for applications.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the concept Probability and distributions	BT1
CO2	**Understand** the concept of Random processes and application.	BT2
CO3	**Apply** the theory of random processes in appropriate field of study	BT3
CO4	**Analyze** the concept to compare the probability distributions	BT4

SYLLABUS (6th SEMESTER)

Subject Name: SEC4 (Mathematical editing tools)		Subject Code: MAT012S601
L-T-P-C: 0-0-4-2	Credit Units: 4	Scheme of Evaluation: P

Objectives: The objectives of **SEC4 (Mathematical editing tools) (MAT012S601)** are to familiarizing students with the usage of mathematical documentation software (LaTeX).

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the basic of programming.	BT1
CO2	**Understand** the different commands used in LaTex.	BT2
CO3	**Apply** Latex to prepare resume, articles, research paper, presentation, etc.	BT3
CO4	**Analyze** the document prepared by LaTex.	BT4

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Programme Outcomes and Course Outcome

B. Des-Communication Design

The Assam Royal Global University
Guwahati – 35

Anuradha Das

The Assam Royal Global University IQAC Estd. 2018

Director, IQAC
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1.1.1 Nature and extent of the B.Des. Communication Design

Communication Design is a component of design that uses visuals that strategically convey a message or express information. Communication Designers take an approach to engage their viewers and communicate the data and knowledge in the message clearly, majorly through print or electronic media. The key areas of study in communication design are:

I. Empathy mapping
II. Art Design History
III. Visualisation Techniques
IV. Design Thinking
V. Colour Theory
VI. Socio Cultural Understanding
VII. Typeface Design
VIII. Semiotics
IX. Branding
X. Print Publication
XI. New Media
XII. Experiential Design
XIII. User Experience and Interface Design
XIV. System Design
XV. Design Entrepreneurship

To broaden the interest for interconnectedness between formerly separate disciplines one can choose from the list of Generic electives for example one can opt for economics, physics, chemistry or any other subject of interest offered by different departments and schools of the Assam Royal Global University as one of the GE papers. Skill enhancement Courses enable the student acquire the skill relevant to the main subject. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Communication English and Behavioural Science are compulsory papers for students of B.Des. Communication Design which enable them to be a better communicator and develop better personality.

As a part of effort to enhance employability of design graduates, the well- structured programme empowers the students with the skills and knowledge leading to enhance career opportunities in various sectors of human activities.

Adv

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Programme Learning Outcomes in B.Des. Communication Design

PO1: Knowledge of Communication Design: The student will be able to demonstrate comprehensive knowledge of Communication design and its subfields, and its applications to one or more disciplines.

PO2: Communications skills: The students will be able to express thoughts and ideas effectively in writing, presenting ideas and orally; They will be able to communicate with others using the different kinds of media at their disposal with the ever-changing fabric of our society in communication; confidently share one's views and express her/his ideas and concepts; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

PO3: Critical Design Thinking: The course will help the students' capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO4: Problem Solving: They will be trained in the capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems with creative and innovative solutions, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO5: Analytical Reasoning: The students will have the ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyse and synthesise data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints. Ability to be able to ask the right questions for reasoning with counter reasoning.

PO6: Research-related skills: They will also gain the ability to define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the findings of the topic.

PO7: Team Work: The students will gain the ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team as a designer will always work in or with a team.

PO8: Reflective Thinking: The critical sensibility to cognitive experiences is taught and practiced by the students, with self awareness and reflectivity of both self, society, enterprises and the world.

PO9: Digital Literacy: The students are made to be aware of all new emergence of technology and well versed with the trends to be able to keep himself/herself relevant.

PO10: Self-Directed Learning: They are trained to have the ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO11: Multi Cultural Competence: The students are sensitized and are given the knowledge to possess the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with

diverse groups. To be able to design and empathize with all ethnic and cultural groups in mind.

PO12: Moral & Ethical Reasoning: They are taught to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Also, to be capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

PO13: Lifelong learning: The students are taught the importance to earn knowledge and skills through self-learning that helps in personal development as well as skill development to make them suitable for changing demands of work place.

Programme Specific Outcomes

PSO-1: Enable a student to be better and effective communicator in visual communication design

PSO-2: Ability to illustrate ideas keeping in mind the principles and elements of design

PSO-3: Ability to apply design processes and thinking to problem solving assignments and projects

PSO-4: Enable a student to identify applications of design in other disciplines and in the real-world, leading to enhancement of career prospects in a relevant fields and research.

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Semester-I

Paper I/Subject Name: Introduction to Communication Design

Course Objective :

The objective of **Introduction to Communication Design (COD082C111)** is to bring about awareness of the world of design.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Remember to unlearn biases and improve their cognitive and knowledge base

CO2: Understand the importance of different art and culture movements

CO3: Apply the understanding of different art and culture movements in their work

CO4: Analyze and synthesize the work of designers in the field of design and art

Paper II/Subject Name: Elements of Design

Objective:

The objective of **Elements of Design (COD082C112)** is to develop skills in manual presentation techniques, use of various media of presentation, principles of compositions and principles of design.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Define concept of design and its elements that comprise it

CO2: Understand the usage of the principles of design

CO3: Apply the various principles of design in their compositions

CO4: Analyze and notice the principles of design used around them and knowing its application and purpose

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Paper III/Subject Name: Colour Theory

Objectives: The objective of **Colour Theory (COD082C113)** is to enable the students to develop the knowledge of colour and its applications.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Remember the application and uses of colour
CO2: Understand the colour terminologies and theory
CO3: Classify and apply the different colour schemes on compositions
CO4: Analyze colour psychology in real world scenarios

SEC/Subject Name: Introduction to Photography

Objective: The objective of **Introduction to Photography (COD082S111)** is to help the students to understand the styles, techniques and technologies used in photography and be able to communicate visually through the medium.

Course Outcomes:

After successful completion of the course, student will be able to:

CO1: Learn the basic properties of a camera.
CO2: Understand the characteristics, properties, physical and visual potential of film and photography
CO3: Apply learnt concepts to their work and be able to communicate visually
CO4: Analyze and apply its usage in apt areas in given projects.

GE/Subject Name: Introduction to Workshop

Objective:

The objective of **Introduction to Workshop (COD082G111)** is to learn to explore different materials which will enhance their creative skills.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Remember materials and its properties

CO2: Understand the characteristics, properties, physical and visual potential of materials in design

CO3: Apply knowledge of materials in their work

CO4: Analyze and apply its usage in apt areas in given projects.

Paper I/Subject Name: Design Thinking

Objectives: The objective of **Design Thinking (COD082C211)** is to develop cognitive, strategic and practical thinking and ideation processes by which design concepts are developed.

Course Outcomes:
After successful completion of the course, student will be able to

- **CO1:** Remember the use of abductive and productive reasoning
- **CO2:** Understand the theories and models of design thinking.
- **CO3:** Apply and adopt solution focused strategies.
- **CO4:** Analyze and resolve ill-defined or 'wicked' problems.
-

Paper II/Subject Name: Visualization Techniques

Objective:
The objective of **Visualization Techniques** is to orient and equip the student with skills to bring their ideas and imagination to reality and to be able to visualize and study data and represent them visually.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Remember methodologies to be able to visualize and interpret data
CO2: Understand how to create through a process of visualization
CO3: Apply the techniques through all the data and information collected
CO4: To represent ideas visually through different methodologies

Paper III/Subject Name: Art of Research

Objective: The objective of the course **Art of Research (COD082C213)** is to orient & equip the student with knowing and practicing research processes to bring direction into their project/ideation of their end product.

Course Outcome:

On completion of this course, students will be able to

CO1: Define raw data efficiently
CO2: Classify different types of data
CO3: Apply different research methods on data
CO4: Analyse different types of data

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SEC/Subject name: Illustration Techniques

Course objectives:
The objective of the course **Illustration Techniques (COD082S211)** is to guide the students to enhance their hand skills with different media and materials

Course Outcome:
On completion of this course, students will be able to

CO1: Remember the basics of hand rendering techniques
CO2: Demonstrate different methods of sketching and rendering
CO3: Apply different techniques through different mediums
CO4: Analyze different types of hand rendering techniques

GE/Subject Name: Introduction to Typography

Objective: The objective of **Introduction to Typography (COD082G211)** is to help the students to understand the impact of a typeface on a design and human psychology.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Learn the basic properties of type

CO2: Understand the characteristics, properties, physical and visual potential of type

CO3: Apply learnt concepts to their work and be able to communicate visually

CO4: Analyze and apply its usage in apt areas in given projects.

Paper I/Subject Name: Communication Design Processes

Objective: The objective of **Communication Design Processes (COD082C311)** is to develop a framework of the processes of design and how to conceptualize and refine ideas into executable reality.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Remember the methods and process
CO2: Understand how to intervene and use the process to ideate
CO3: Apply the different processes and methods to bring solutions
CO4: Analyze problems and briefs and follow the processes to get conceptual ideas to the table

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Paper II/Subject Name: Semiotics

Objective: The objectives of **Semiotics (COD082C312)** is to impart the principles of signs and symbols and their use or interpretation

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Define terms related to symbols & icons.
CO2: Understand the laws guiding semiotics.
CO3: Apply different laws of semiotics to solve related problems
CO4: Examine theories of semiotics to solve real field problems.

DSE/Subject Name: Visual Language

Objectives: The objective of **Visual Language (COD082D311)** is to help the students to analyze the system of communication using visual elements. The course will also increase student's ability to comprehend the perception, comprehension and production of visible signs.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Recall different terms and definitions related to visual communication
CO2: Understand the different methods of visual language and terminologies
CO3: Apply different methods to solve related problems of visual language.
CO4: Analyse the solution of visual communication to physical or real-life problems.

DSE/Subject Name: Form Studies

Objectives: The objective of **Form Studies (COD082D312)** is to help the students to be able to create and bring to life forms from their imagination to reality. They will attain knowledge of materials and manufacturing processes.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Recall different terms and definitions related to forms and textures
CO2: Understand the different methods of creating forms
CO3: Apply different methods to make shapes and forms.
CO4: Analyse the solution of visual communication to physical or real-life problems with respect to creating forms.

GE/Subject Name: Art History & Culture Studies

Objective: The objective of the course **Art History & Culture Studies (COD082G311)** is to impart a theoretical and practical understanding of art history and practice of planning and projecting ideas from these eras.

Course Outcome:

On completion of this course, students will be able to

CO1: Remember culture and history of different ages and eras
CO2: Understand the concept of these different art eras.
CO3: Apply the concept of art and culture in relevant areas.
CO4: Analyze the different practices of planning and projecting ideas into projects.

Paper I/Subject Name: Brand Identity Design

Objective: The objective of **Brand Identity Design (COD082C411)** is to give essential understanding of what constitutes a brand and how a brand is built from the ground up with all of its visual elements that support it.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Remember what defines a brand
CO2: Understand the theories of building a brand and its identity
CO3: Apply the concepts of branding and the perception dealing with branding
CO4: Analyze brands and its perception among consumers

Paper II/Subject Name: Typeface Design

Objective: The objective of **Typeface Design (COD082C412)** is to understand the basic concepts of fonts and type design.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Remember the anatomy and functions of Type.
CO2: Understand the theories of Typeface Design
CO3: Apply the understanding and concept of Typeface into their work
CO4: Analyze different concepts and understanding of Typeface design.

DSE/Subject Name: Packaging Design

Objective: The objective of **Packaging Design (COD082D411)** is to develop an in-depth understanding and knowledge of packaging processes and how to design for a product.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Recall different terms and definitions related to packaging design
CO2: Understand the different methods related to packaging of products.
CO3: Apply different methods to solve related problems of packaging design
CO4: Analyse the solution of packaging design related to real life situations and knowing its materials and usage.

DSE/Subject Name: Retail Design

Objective: The main objective of **Retail Design (COD082D412)** is to impart fundamental techniques of how to create and improve the image of a store.

Course Outcomes:
After successful completion of the course, student will be able to

CO1: Identify the terms used in retail spaces.

CO2: Understand the concept and theories of Retail Design.

CO3: Apply the different techniques and methods to sell products in retail spaces.

CO4: Analyse different markets and methods to be able display and sell products in challenging spaces.

SEC/Subject Name: Film & Media

Course Objectives:
The objective of **Film & Media (COD082S411)** is to familiarize the student with the various elements and processes undertaken for making a film.

Course Outcomes: This course will enable the students to:

CO1: Remember the different methods and processes of film making
CO2: Demonstrate different functions of film making in relevant situations
CO3: Apply the knowledge of filming and production
CO4: Analyze and know how to produce and make good films that communicate with the masses.

GE/Subject Name: Printing Technology

Course Objectives:
The objective of **Printing Technology (COD082G411)** is to familiarize every procedures of assembling the films for the operating printing equipments and the well finished jobs of cutting the finished works; are enlightened to the students.

Course Outcomes: This course will enable the students to:

CO1: Remember the different methods and processes of printing
CO2: Demonstrate different functions of printing in relevant situations
CO3: Apply the knowledge of printing techniques
CO4: Analyze good printing methods and processes in real world situations for clients.

Paper I/Subject Name: User Interface Graphics

Course Objectives:
The objective of **User Interface Graphics (COD082C511)** is to give an understanding of interactive graphic interfaces and its kinds.

Course Outcomes: This course will enable the students to:

CO1: Remember the principles of interface design.
CO2: Demonstrate different methods of interaction with interfaces.
CO3: Apply the knowledge of interface design.
CO4: Analyze user interface designs for real world applications.

Paper II/Subject Name: User Experience

Course Objectives:
The objective of **User Experience (COD082C512)** is to give an indepth study of the process of understanding user behaviour through usability, usefulness, and desirability provided in the interaction with a product.

Course Outcomes: This course will enable the students to:

CO1: Remember the different methods undertaken to study user experiences.
CO2: Demonstrate different methods of understanding user experience design.
CO3: Apply the knowledge and methods of user experience design.
CO4: Analyze user experience designs for real world applications.

DSE/Subject Name: Publication Design

Course Objectives:
The objective of **Publication Design (COD082D511)** is to give an indepth study on the process of editorial design and its kinds

Course Outcomes: This course will enable the students to:

CO1: Remember the process of publishing.
CO2: Demonstrate different methods of making publications.
CO3: Apply the knowledge and methods of publication design.
CO4: Analyze good publishing methods and processes in real world situations for clients.

DSE/Subject Name: Product Photography

Course Objectives:
The objective of **Product Photography (COD082D512)** is to study the techniques and methods of product photography

Course Outcomes: This course will enable the students to:

CO1: Remember the process of photography.
CO2: Demonstrate different methods of photography in a studio setting.
CO3: Apply the knowledge and methods of product photography.
CO4: Analyze good methods and processes of photography for products.

DSE/Subject Name: Motion Graphics

Course Objectives:
The objective of **Motion Graphics (COD082D513)** is to gain a detailed understanding of what goes into motion graphics in the digital world.

Course Outcomes: This course will enable the students to:

CO1: Remember the process of motion.
CO2: Demonstrate different methods and skills to communicate through motion.
CO3: Apply the knowledge and methods of motion graphics.
CO4: Analyze the processes of motion in real world situations.

DSE/Subject Name: Animation

Course Objectives:
The objective of **Animation (COD082D514)** is to gain a detailed understanding of what goes into animating and moving art.

Course Outcomes: This course will enable the students to:

CO1: Remember the process of animation.
CO2: Demonstrate different methods and skills to communicate through animation.
CO3: Apply the knowledge and methods of animation.
CO4: Analyze the processes of animation.

Paper I/Subject Name: New Media Design

Course Objectives:
The objective of **New Media Design (COD082C611)** is to give an understanding of how design is impactful through various kinds of media in context to the present and future prospects of media.

Course Outcomes: This course will enable the students to:

CO1: Remember the principles and ideologies to media and communication.
CO2: Demonstrate the process of working with new media.
CO3: Apply the knowledge gained working with new media.
CO4: Analyze the usage and application of communication through new media for real world applications.

Paper II/Subject Name: Experiential Graphic Design

Course Objectives:
The objective of **Experiential Graphic Design (COD082C612)** is to give an understanding of how people interact with a space in order to gain an understanding of what an organization's brand is all about – connecting people to spaces.

Course Outcomes: This course will enable the students to:

CO1: Remember the principles and purpose of how a space can be experienced with the help of using visual graphics and communication tools.
CO2: Demonstrate ways to experience a space in different innovative & unique ways.
CO3: Apply the knowledge gained working with experiential design.
CO4: Analyze the usage and application of experiential graphic design in spaces.

DSE/Subject Name: Print Advertising

Course Objectives:
The objective of **Print Advertising (COD082D611)** is to give an understanding of creation and organization of visual artwork used in advertisements for products and services.

Course Outcomes: This course will enable the students to:

CO1: Remember the principles of advertising
CO2: Demonstrate methods of printing in advertising.
CO3: Apply the various methods and principles of advertising.
CO4: Analyze the usage of print advertising in real world applications.

DSE/Subject Name: Ad Films.

Course Objectives:
The objective of **Ad Films (COD082D612)** is to give an understanding of creation and organization of making films advertisements for products and services.

Course Outcomes: This course will enable the students to:

CO1: Remember the principles of advertising
CO2: Demonstrate methods of advertising with the help of Film.
CO3: Apply the various methods and principles of advertising.
CO4: Analyze the usage of film ads in real world applications.

DSE/Subject Name: Design Management

Course Objectives:
The objective of **Design Management (COD082D613)** is to bring a learning that enables innovation and create effectively-designed products, services, communications, environments, and brands that enhance our quality of life and provide organizational success.

Course Outcomes: This course will enable the students to:

CO1: Remember the methods of strategic design management
CO2: Demonstrate the understanding of design management at various organizational levels.
CO3: Apply the various methods and principles of design management.
CO4: Analyze the usage of design management in real world scenarios to bring about effective change and value to an organization.

DSE/Subject Name: Brand Journalism

Course Objectives:
The objective of **Brand Journalism (COD082D614)** is to bring a learning that enables involves telling journalism-style stories about a company that make readers want to know more, stories that don't read like marketing or advertising copy

Course Outcomes: This course will enable the students to:

CO1: Remember the methods of Brand Story telling
CO2: Demonstrate the understanding of journalism of brands
CO3: Apply the various methods and principles of journalism.
CO4: Analyze the usage of Brand journalism in real world scenarios

DSE/Subject Name: Exhibition Design

Course Objectives:
The objective of **Exhibition Design (COD082D615)** is to understand the process of conveying information through visual storytelling and environment.

Course Outcomes: This course will enable the students to:

CO1: Remember the various methods involved in exhibition design
CO2: Demonstrate the understanding of spaces for exhibition design.
CO3: Apply the various methods and principles of exhibition design.
CO4: Analyze the usage of exhibition design in real world scenarios to bring about effective change and value to an organization.

DSE/Subject Name: Set Design

Course Objectives:
The objective of **Set Design (COD082D616)** is to understand the process of creating environments for visual storytelling.

Course Outcomes: This course will enable the students to:

CO1: Remember the various methods involved in set design
CO2: Demonstrate the understanding of spaces for set design.
CO3: Apply the various methods and principles of set design.
CO4: Analyze the usage of set design in real world scenarios to bring about effective change and value to an organization

SEC/Subject Name: Documentation & Presentation

Course Objectives:
The objective of **Documentation and Presentation (COD082S611)** is to understand the process of documenting data and information.

Course Outcomes: This course will enable the students to:

CO1: Remember the various methods involved in documenting.
CO2: Demonstrate the steps and methods employed to document data.
CO3: Apply the various methods and principles of documentation.
CO4: Analyze and use the methods of documentation.

Paper I/Subject Name: System Design

Course Objectives:
The objective of **System Design (COD082C711)** is to understand how to intervene and integrate with creative solutions within a system or organization to make it more efficient.

Course Outcomes: This course will enable the students to:

CO1: Remember the various methods involved in system research and design.
CO2: Demonstrate the ideologies learnt through system design.
CO3: Apply the various methods and principles of system design.
CO4: Analyze and use the methods of design intervention in systems.

DSE/Subject Name: Design Entrepreneurship

Course Objectives:
The objective of **Design Entrepreneurship (COD082D711)** is about producing and marketing the intellectual properties of a viable concept in terms of assuming risks, financing and managing. So this study is about a discussion on building entrepreneurship skills in design education.

Course Outcomes: This course will enable the students to:

CO1: Remember the various ideologies in entrepreneurship.
CO2: Demonstrate the ideologies learnt.
CO3: Apply the various methods and principles of design entrepreneurship.
CO4: Analyze and use the methods of design entrepreneurship in real world situations

DSE/Subject Name: Design Business Strategy

Course Objectives:

The objective of **Design Business Strategy (COD082D712)** is to apply the tactical thinking of a business strategy to the needs of the user to create the most effective product. This intersection between corporate strategy and design thinking achieves long-term goals through creative applications targeted at the end user

.

Course Outcomes: This course will enable the students to:

CO1: Remember the various ideologies in strategy and planning.
CO2: Demonstrate the ideologies learnt.
CO3: Apply the various methods and principles of design strategy.
CO4: Analyze and use the methods of design strategy in real world situations.

Paper I/Subject Name: Portfolio Design

Course Objectives:

The objective of **Portfolio Design (COD082C811)** is to prepare for a professional career with a design document to put forward oneself to the company / client.

Course Outcomes: This course will enable the students to:

CO1: Remember the various methods involved in system research and design.
CO2: Demonstrate the ideologies learnt through system design.
CO3: Apply the various methods and principles of system design.
CO4: Analyze and use the methods of design intervention in systems.

Anuradha Deb

THE ASSAM
ROYAL GLOBAL UNIVERSITY
GUWAHATI

Programme Outcomes and Course Outcome

Bachelor of Physiotherapy

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd 2021

Anwesha Dev

Director, IQAC
The Assam Royal Global University

1.1 Nature and Extent of Bachelor's Degree Programme in Physiotherapy

A bachelor's degree in Physiotherapy is a **4 year and 6 months** degree course divided into 8 semesters with 6 months of rotatory clinical internship.

Sl. No.	Year	Mandatory Credits to be Secured for the Award
1	1st	48
2	2nd	48
3	3rd	52
4	4th	32
Total Credits		**180**

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Program Learning Outcomes for Bachelor of Physiotherapy(POs):

PO 1 **Disciplinary knowledge about Physiotherapy Profession**

To demonstrate behavioural skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals

PO 2 **Psychomotor Skills**

To demonstrate and relate moral, ethical values and legal aspects concerned with Physiotherapy management.

PO 3 **Communication skill**

To develop healthy Physiotherapist – Patient relationship

PO 4 **Critical thinking**

To demonstrate academic skills and knowledge related to understanding the structural and functional of human body and applied anatomy, physiology in physiotherapy practice.

PO 5 **Problem Solving skill**

To apply and outline pathology of medical conditions in context with Physiotherapy, interpret& use medical communication.

PO 6 **Analytical reasoning**

To apply knowledge of biomechanics of human movement in musculoskeletal, neurological and cardio-respiratory conditions in planning, recommending, and executing Physiotherapy management.

PO 7 **Research Related Skills**

To outline and implement Physiotherapy management by co-relating assessment and examination skills of clinical subjects like Orthopaedics, General Surgery, Medicine, Neurology, Paediatrics, Dermatology & Gynaecology & Obstetrics, Community Medicine and Sociology

PO 8 **Team work**

To demonstrate skill in developing teamwork approach in managing various conditions who require multidisciplinary medical management including medical professionals , social workers and other related professionals.

PO 9 **Socio-cultural and multicultural competency**

To describe and analyse concepts of energy conservation, global warming and pollution and justify optimal use of available resources.

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PO 10 **Awareness of moral, ethical and legal issues related to Physiotherapy Profession**

To demonstrate ability of critical thinking, scientific enquiry, experiential learning, personal finance, entrepreneurship and managerial skills related to task in day-to-day work for personal & societal growth.

PO 11 **Lifelong learning Process**

Students must demonstrate ability to acquire knowledge and skills through ongoing learning, participation in continuous education programs.

Programme Specific Outcomes (PSOs)

PSO 1 Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.

PSO 2 Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.

PSO 3 Continually and systematically reflect on practice and, whenever necessary, integrate that reflection into action, using improvement techniques and audit.

PSO 4 Manage time and prioritize tasks, and work autonomously when necessary and appropriate.

PSO 5 Recognize own personal and professional limits and seek help from colleagues and supervisors when necessary.

PSO 6 Function effectively as a mentor and teacher including contributing to the appraisal, assessment and review of colleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.

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Level: Semester I

Course: C-1

Title of the Paper: ANATOMY I

Course Objectives

Identify all gross anatomical structures, particular emphasis will be placed on description of bones, joints, muscles, brain, cardio-pulmonary and nervous systems as these relate to the application of Physiotherapy. Understanding the different type of classification and general features of bone, joints and muscular tissues.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the anatomy of upper quadrant including spine, thorax and upper extremities:	**BT 1**
CO 2	**Understand** the bones, joints, soft tissues, muscles related to musculoskeletal system of upper extremities and to localize various surface land-marks of face, neck, spinal cord.	**BT 2**
CO 3	**Demonstrate** the bones, muscles, nerve and ligaments of the upper extremities.	**BT 3**
CO 4	**Analyze** the course of peripheral nerves including their functions and structures.	**BT 3**

Course: C-2

Title of the Paper: PHYSIOLOGY-I

Course Objectives

Objective of the course is to demonstrate and understanding of elementary human physiology dealing with cell, skin, muscle, blood and other important systems of the body. Detail knowledge of different types and functions of blood cells. Alteration of normal physiology in terms of different diseases.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** varous structural and functional importance of cell, muscle and skin.	**BT 1**
CO 2	**Explain** different tissues & organs of different systems of human body.	**BT 2**
CO 3	**Understand** how abnormal Physiology affects human function and dysfunction of the human body.	**BT 2**
CO 4	**Demonstration** of normal human physiology with special emphasis on the functioning of the cardiovascular, musculo-skeletal and nervous systems.	**BT 3**

Course: C-3

Title of the Paper: Biomechanics I

Course Objectives

The objectives of this course is that after 60 hours of lectures and demonstrations the student will be able to demonstrate an understanding of the principles of biomechanics and biomechanical understanding in application related health and disease pertaining to muscles and joints of upper limb.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the various terms used in mechanics, biomechanics & kinesiology	**BT 1**
CO 2	Explain the basic principles of biophysics related to mechanics of movement / motion & apply these principles to simple equipment designs along with their efficacy in Therapeutic Gymnasium & various starting positions used in therapeutics .	**BT 2**
CO 3	Demonstrate movements in terms of anatomical planes and axes, demonstrate various starting & derived positions used in therapeutics.	**BT 3**
CO 4	Apply therapeutic skills of movement examination.	**BT 3**

Course: GE 1

Title of the Paper: Biochemistry

Course Objectives

After completion of the course the students will be able to learn about the biochemical function and metabolism.

Acquire knowledge in biochemistry that is required to be practiced in community and all other levels of healthcare system.

Understand various relevant medical investigations which will help to diagnose a pathological condition.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe carbohydrate, fat and protein metabolism , classification, digestion, absorption , regulation and clinical	**BT 1**
CO 2	Define bio-enzymes, classify, factors affecting enzyme action and therapeutic uses	**BT 2**
CO 3	Discuss normal levels in body fluids required for functioning and their abnormal levels to understand the disease process.	**BT 3**
CO 4	Demonstrate knowledge related to biochemical mechanisms of muscle contraction and biochemistry of connective tissue and apply these in treating various pathological conditions.	**BT 3**

Course: C-1
Title of the Paper: ANATOMY LAB I

Course Objectives
The objective of the course is to introduce students the practical gained regarding anatomy of various structures and the histological appearance of various organs of the human body. Identification of the upper limb bones and their features.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** and understand the normal anatomy of the human body, which will help them to diagnose and treat diseases in the near future.	**BT 1**
CO 2	**Explain** the layers of meninges of the brain and spinal cord and parts of the peripheral nervous system	**BT 2**
CO 3	**Demonstrate** all the muscles, bones, ligaments and nerves of upperlimb	**BT 3**
CO 4	**Analyze and** Identify the parts of the central nervous system; cerebrum, cerebellum, midbrain, pons and medulla oblongata. Spinal cord and parts of the spinal cord	**BT 3**

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Course: C-2

Title of the Paper: PHYSIOLOGY LAB-I

Course Objectives

The objective of the course is to learn about various vitals in normal & the alterations in physiology of human body.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** to apply appropriate safety & ethical standards.	**BT 1**
CO 2	**Identify** & locate the anatomical structures	**BT 2**
CO 3	**Demonstrate** the steps involved in the methods.	**BT 3**
CO 4	**Apply** the knowledge & methods in regular life.	**BT 3**

Course: Core (C3)

Subject: Biomechanics Lab I

Course Objective:

The objectives of this course is that after practical demonstrations the student will be able to illustrate an understanding of the principles of biomechanics and biomechanical understanding in application related health and disease pertaining to muscles and joints of upper limb.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** different types of muscles, palpate the muscles and able to recognize different types of muscle action	**BT 1**
CO 2	**Identification** and uses of various tools for purpose of exercises and rehabilitation.	**BT 2**
CO 3	**Demonstrate** active movements of joints in different planes and axes.	**BT 3**
CO 4	**Analyse** various motions of the human joints from normal and pathological perspective in normal individuals and in pathological condition .	**BT 4**

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Level: Semester II

Course: C-1
Title of the Paper: ANATOMY II

Course Objectives
The objectives of the course is to introduce students regarding Anatomy of various structures, histological appearance of various organs of the human body. Understanding Digestive, cardiovascular system & Genito- Urinary and outline of Endocrine system.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** – Identify & describe the origin/insertion, nerve /blood supply, root value & function of various skeletal muscles (including lower extremity and spine) , course of peripheral nerves	**BT 1**
CO 2	**Understand** the various surface land-marks, apply related radiological and living anatomy.	**BT 2**
CO 3	**Demonstrate** the bones, joints, soft tissues, muscles related to musculoskeletal system of spine & lower extremities. (including lower extremity and spine) , course of peripheral nerves	**BT 3**
CO 4	**Analyze** the movements of lower extremity joints	**BT 3**

Course: C-2

Title of the Paper: PHYSIOLOGY-II

Course Objectives

To introduce students normal physiology of various human body systems along with understand the alterations of physiology in diseases. Students will learn about the basic physiology of digestive, endrocrine, renal & reproductive system.

Course outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Outline** of different parts and functions of excretory, endocrine, reproductive system.	**BT 1**
CO 2	**Explain** Basic bio chemistry of different stages of digestion & metabolism of carbohydrates, lipids & proteins.	**BT 2**
CO 3	**Understand** various hormonal actions to regulate normal physiology & applied physiology.	**BT 3**

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Course: Core (C3)

Subject: Biomechanics II

Course Objective:

The objectives of this course is that the student will be able to demonstrate an understanding of the principles of Biomechanics and Kinesiology.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** Categorize the structure & functions of cervical, thoracic, lumbar and sacral vertebra.	**BT 2**
CO 2	**Identify** general and specific features of the hip, knee, and ankle complex.	**BT 3**
CO 3	**Analyze** the pathological basis of injury and aging of the hip, knee and ankle complex.	**BT 4**
CO 4	**Analyse** different postural malalignment like scoliosis, kyphosis, lordosis and fixed flexion deformity ,about the variation between different pathological gait patterns .	**BT 4**

Course: GE-1

Title of the Paper: PSYCHOLOGY AND SCIOLOGY

Course Objectives

- The objective of the course is to introduce students to the Psychology and study of various behavioural patterns of individual.
- Students will able to learn about the communication and interaction skills appropriate to various age groups
- The objectives of the course is to introduce students about Sociology which will help them to work in society
- Will know more about different cultures in the society

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Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	relate the concepts of the term Psychology & its importance in health delivery system, explain psychological maturation during development & psychological alterations during aging. Relate to the different culture in the society	**BT 1**
CO 2	explain the importance of psychological status of the person in health & disease and emotional status of a patients. Understanding social factors affecting health, influence of family, culture, community on health perspectives	**BT 2**
CO 3	Apply skills for good interpersonal communication with the patient and the family member. Apply skills for good interpersonal communication with the patient and with the society	**BT 3**
CO 4	Analyze various psychiatric disorders, Identifying intelligence (IQ)among the patients. Analyze stress and its relation with the health ,and also with the community	**BT 4**

Course: C-1
Title of the Paper: ANATOMY LAB II

Course Objectives
The objective of the course is to introduce students the practical gained regarding anatomy of various structures and the histological appearance of various organs of the human body. Identification of the lower limb bones and their features.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**relate** the normal anatomy of the human body, which will help them to diagnose and treat diseases in the near future.	**BT 1**
CO 2	**Explain** the functions of all the organs and lower limb bones.	**BT 2**
CO 3	**Identify** all the muscles and bones of lowerlimb.	**BT 3**
CO 4	**Analyzing** the parts and functions of all the organs of the lower limb applying on the patients	**BT 3**

Course: C-2

Title of the Paper: PHYSIOLOGY LAB - II

Course Objectives

The objective of the course is to learn about the various lung volumes in normal & alternative physiology of human body. Learn about the various blood components haemoglobin, RBC, WBC, ESR, blood grouping etc.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** to apply appropriate safety & ethical standards,	**BT 1**
CO 2	**Identify** & use of laboratory equipments such as microscope, test tube, needle etc.	**BT 2**
CO 3	**Demonstrate** the steps involved in the methods.	**BT 3**
CO 4	**Apply** the knowledge & methods in regular life.	**BT 3**

Course: Core (C3)

Subject: Biomechanics Lab II

Course Objective:

The objectives of this course is that after practical demonstrations the student will be able to illustrate an understanding of the principles of biomechanics and biomechanical understanding in application related health and disease pertaining to muscles and joints of lower limb and spine.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the normal biomechanics of the joints of the lower extremity and spine in human body.	**BT 2**
CO 2	**Apply** postural analysis knowledge based upon observational skills and quantitative motion analysis to rule out various conditions.	**BT 3**
CO 3	**Analyse** various motions of the human joints from normal and pathological perspective in normal individuals and in pathological condition	**BT 4**
CO 4	**Analyse** symptoms to diagnose and treat altered biomechanics for conditions in the near future.	**BT 4**

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Level -Semester-III

Course: C 1

Title of the Paper: Exercise Therapy-I

Course Objectives:

The objective of the course is after student will be able to apply the different types of exercises in different conditions considering the indications and contraindications of the procedure and describe the effects of the techniques.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of muscle and joint function and describe the use of various equipment's and techniques.	**BT 2**
CO 2	**Demonstrate** how to grade the strength of muscle and how to measure the joint range of motion.	**BT 3**
CO 3	**Demonstrate** the technique of different types of movements, massage therapy muscle training and fitness training concepts.	**BT 3**
CO 4	**Analyse** the problem of the patient and plan the treatment required based on problem of the patient.	**BT 4**

Course: C2

Subject: Electrotherapy I

Course Objective:

The course objective is that after completion of this course the students will be able to understand the basic aspects of electrotherapy, low frequency current & radiation therapy & utilize contemporary & recent methods to select the most appropriate method to alleviate pain for patients.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the basics of electricity and its physiological & therapeutic effects gained	**BT 1**
CO 2	**Illustrate** about pain and pain modulation mechanism & **examine** neuromuscular dysfunctions by using electro-diagnostic test	**BT 2**
CO 3	**Apply** the construction, biophysical principles and effects, dangers, safety measures, judicial use, appropriate methods of application, contraindications of the various low frequency equipments & radiation therapy units.	**BT 3**
CO 4	**Examine** the principles and techniques of different electrotherapy modalities in the restoration of physical function in condition like nerve injuries.	**BT 4**

Course: C1

Title of the Paper: Exercise therapy Lab-I

Course Objectives:

The objective of the course is after student will be able to apply the different types of exercises in different conditions considering the indications and contraindications of the procedure and describe the effects of the techniques.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of muscle and joint function and describe the use of various equipment's and techniques.	**BT 2**
CO 2	**Demonstrate** how to grade the strength of muscle and how to measure the joint range of motion.	**BT 3**
CO 3	**Demonstrate** the technique of different types of movements, massage therapy muscle training and fitness training concepts.	**BT 3**
CO 4	**Analyse** the problem of the patient and plan the treatment required based on problem of the patient.	**BT 4**

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Course: Core (C3)

Subject: Electrotherapy Lab I

Course Objective:

The course objective is that after completion of this course the students will be able to acquire the knowledge of application of various electrotherapy modalities and demonstrate the different techniques and describe their effects.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** appropriate diagnostic skill based on the clinical need of the patients	**BT 2**
CO 2	**Apply** the effective electrotherapy treatment methods with privacy and precautions	**BT 3**
CO 3	**Simplify** safe and efficient application of advanced physical agents like IRR & UVR	**BT 4**
CO 4	**Analyze** accurate electro-diagnostic tests and interpret its findings prior to the selection of therapeutic currents	**BT 4**

Course: DSE

Title of the paper: Pathology & Microbiology I

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** the microbiology of various conditions, diseases and disorders and changes in structure and function of cells during disease condition gained.	**BT 1**
CO 2	**Understand** how to protect themselves and their patients from infections during their interactions and the cell injury &response of different tissues, organs and capacity	**BT 2**
CO 3	**Explain** morphology, mode of infection, multiplication of medically important viruses & their treatment.	**BT 2**
CO 4	**Demonstrate** the microbiology of common diseases that therapists would encounter in their daily practice and also the pathology of common diseases that therapists would encounter in their daily practice.	**BT 3**

Course: DSE

Title of the paper: Biostatistics

Course Objective:

After completion of this course the students will be able to explain key research concepts and issues and also read, comprehend, and explain research articles in their academic discipline.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Describe the role of statistical methods for the design of research in public health & health sciences;**	**BT 1**
CO 2	**Classify population, sample, parameter, sampling frame and statistic**	**BT 2**
CO 3	**Apply statistical knowledge to design and conduct research studies methods**	**BT 3**
CO 4	**Develop proficiency in analysing data using various**	**BT 3**

Course : GE-I

Title of the Paper: Pharmacology I

Course Objectives:

The objectives of the course is to introduce students about Pharmacology and learn to apply these knowledge into practice and also will know about effects and adverse effects of drugs.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** pharmacological effects of commonly used drugs by patients referred for Physiotherapy	**BT 1**
CO 2	**Understanding** formulation& route of administration	**BT2**
CO 3	**Apply** knowledge about adverse reactions, precautions to be taken & contraindications for conditions.	**BT 3**
CO 4	**Analyse** utilization of drugs.	**BT 4**

Level- Semester IV

Course: C1

Title of the Paper: Exercise Therapy II

Course Objectives:

The objective of the course is after student will be able to apply the different types of exercises in different conditions considering the indications and contraindications of the procedure and describe the effects of the techniques.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of use of therapeutic exercise in various conditions.	**BT 2**
CO 2	**Demonstrate** manual therapeutic techniques used in rehabilitation of patients.	**BT 3**
CO 3	**Demonstrate** various specialized techniques used in physiotherapy like PNF, mobilization and manipulation, and group therapy	**BT 3**
CO 4	**Analyse** normal human posture & various normal musculoskeletal movements during Gait, activities of daily living	**BT 4**

Course: C2

Subject: Electrotherapy II

Course Objective:

The course objective is that after completion of this course the students will understand the basic aspects of medium & high frequency currents, thermotherapy, cryotherapy & electrodiagnosis & utilize contemporary & recent methods to select the most appropriate method to alleviate pain for patients.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the biophysical & bio physiological changes which occur with thermotherapy & cryotherapy	**BT 2**
CO 2	**Identify** the construction, Biophysical principles and effects, dangers, safety measures, judicial use, appropriate methods of application, contraindications of the various medium, high frequency equipments & LASER therapy.	**BT 3**
CO 3	**Analyse** the proper clinical applications for hot packs, paraffin bath, fluidotherapy, whirlpool, contrast bath & cryotherapy	**BT 4**
CO 4	**Select** the commonly used electro diagnostic tests like Electromyograph, nerve conduction study in relevant conditions	**BT 5**

Course: C1

Title of the Paper: Exercise Therapy Lab-II

Course Objectives:

The objective of the course is after student will be able to apply the different types of exercises in different conditions considering the indications and contraindications of the procedure and describe the effects of the techniques

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of use of therapeutic exercise in various conditions.	**BT 2**
CO 2	**Demonstrate** manual therapeutic techniques used in rehabilitation of patients.	**BT 3**
CO 3	**Demonstrate** various specialized techniques used in physiotherapy like PNF, mobilization and manipulation, and group therapy, use of assistive devices ,use of hydrotherapy and traction.	**BT 3**
CO 4	**Analyse** and assess variations in normal human posture & various Gait abnormalities, activities of daily living, Mat exercises .	**BT 4**

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Course: C2

Subject: Electrotherapy Lab II

Course Objective:

The course objective is that after completion of this course the students will be able to gain knowledge regarding various electrotherapy modalities & understand the indications, contraindication and application of various electrotherapy modalities.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**List** contemporary and recent methods and to select the most appropriate method to moderate and alleviate pain for patients	**BT 1**
CO 2	**Demonstrate** different techniques and describe the dosage parameters & effects of various types of electrotherapy modalities like IFT, SWD, MWD & US & LASER	**BT 2**
CO 3	**Build** appropriate patient education procedures for safe application of superficial thermal agents & cryotherapy.	**BT 3**
CO 4	**Take part** in accurate electro-diagnostic tests & appreciate the use of these tests in research work.	**BT 4**

Course: DSE

Title of the Paper: PATHOLOGY & MICROBIOLOGY-II

Course Objectives

The subject involve the study of common organisms causing disease including nosocromial infections & precautionary measures to protect one from acquiring infections. To understand various types of immune system & its action against various diseases. By understanding microbiology & pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** the various bacterial & viral diseases which are contagious along with its pathology.	**BT 1**
CO 2	**Understand** the Pathogenesis and pathological changes of disease in various body system & how to protect themselves and their patients from infections during their interactions or	**BT 2**
CO 3	**Explain** morphology, mode of infection, multiplication of medically important viruses & bacteria with their treatment.	**BT 2**
CO 4	**Demonstrate** the microbiology & pathology of common diseases that therapists would encounter in their daily practice.	**BT 3**

Course: DSE

Title of the paper: Research Methodology

Course Objective:

After completion of this course the students will be able to explain key research concepts and issues and also read, comprehend, and explain research articles in their academic discipline.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define and discuss the role and importance of research to health practice	**BT 1**
CO 2	Explain the issues and concepts salient to the research process.	**BT 2**
CO 3	Selecting a research problem, selecting an appropriate research design, and implementing a research project.	**BT 3**
CO 4	List concepts and procedures of sampling, data collection and reporting.	**BT 4**

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Course: SEC

Title of the Paper: INTRODUCTION TO TREATMENT

Course Objectives

- The objective of the course is to help students to learn about the various field of treatment in physiotherapy.
- Students will able to learn about the communication and interaction skills appropriate to various age groups during treatment.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** various treatment field & its importance in health care delivery system & also learn about general information regarding hospital wards.	**BT 1**
CO 2	**Learn** the importance of psychological status of the person in health & disease and emotional status of a patients during treatment.	**BT 1**
CO 3	**Explain** various assessment, tests, communication & interventions.	**BT 2**
CO 4	**Analyze** different equipments & exercises with their uses in various types of cases.	**BT 3**

Course: GE-1

Title of the Paper: Pharmacology -II

Course Objectives:

The objectives of the course is to introduce students about Pharmacology and learn to apply these knowledge into practice and will know about effects and adverse effects of drugs.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify pharmacological effects of commonly used drugs by patients referred for Physiotherapy**	**BT 1**
CO 2	**Understanding formulation& route of administration**	**BT2**
CO 3	**Apply knowledge about adverse reactions, precautions to be taken & contraindications for conditions.**	**BT 3**
CO 4	**Analyse utilization of drugs.**	**BT 4**

Level: Semester V

Course: C1

Title of the Paper: CLINICAL ORTHOPAEDICS & TRAUMATOLOGY

Course Objectives

- To introduce students to acquire knowledge of the Orthopedic problems and enable them to practice application in human body.
- The students will be able to discuss the patho-physiology, clinical manifestations & conservative/Surgical management of various traumatic & cold cases of the Musculo-skeletal Conditions

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the different condition related to musculoskeletal	**BT 1**
CO 2	**Learn** the pathophysiology of every musculoskeletal condition along with its complication	**BT 2**
CO 3	**Explain** various assessment, tests, communication & medical intervention	**BT 3**

Course: C2

Title of the Paper: GENERAL SURGERY, OBSTETRICS AND GYNAECOLOGY

Course Objectives:

- The objective of the course is to help students to identify cardio respiratory dysfunction through assessment and investigations and demonstrate all the techniques required to restore the cardio respiratory function.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the pathophysiology of various cardio respiratory disorders	**BT 2**
CO 2	**Application** of the different skills to restore the cardio respiratory dysfunction	**BT 3**
CO 3	**Demonstrate** different techniques and have an idea on use of adjuncts along with physiotherapy techniques.	**BT 3**
CO 4	**Analyse** the various cardio-respiratory dysfunctions based on signs and symptoms of the disease.	**BT 4**

Course: DSE

Title of the Paper: GENERAL MEDICINE

Course Objectives

To introduce students the causes, clinical presentation and treatment of various diseases of the human body and to introduce the general surgical procedures and enable the students to understand the concepts of various surgical conditions like abdominal surgeries, vascular surgeries , thoracic surgeries and also gynaecological as well obstetrical.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** to the various diseases affecting the human body and to understand the clinical manifestation and the signs and symptoms	**BT 1**
CO 2	**Understand** the various surgical procedures done over human body and also which all are the structures being cut and how to manage the postsurgical patients and also the basic physiology and mechanism of child birth.	**BT 2**
CO 3	**Applying** the various treatment strategies for the diseases and the management for various gynaecological problems in adolescence and adult conditions like infections, urogenital dysfunction and prolapse of uterus	**BT 3**
CO 4	**Analyze** the disease pathology and plan strategies to manage them and to analyze the developmental anatomy of embryonic and fetal periods.	**BT 3**

Course: DSE

Title of the Paper: COMMUNITY MEDICINE

Course Objectives

The objective of the course is to understand the influence of social and environmental factors of individual and society. Various aspects of health & disease list the methods of health administration, health education & disease preventive measures.

Course outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the effects of the environment and the community dynamics on the health of the individual.	**BT 1**
CO 2	**Categorize** the various national health schemes and its benefits.	**BT 2**
CO 3	**Explain** about communicable and non communicable diseases and its implications.	**BT 3**
CO 4	**Apply** the knowledge to recognize the common health problems including their physical, emotional and social aspects at the individual, family and community levels and deal with public health emergencies.	**BT 3**

Course: DSE

Title of the Paper: Principles of Manual Therapy

Course Objectives

- The objectives of this course is to make the students understand the concept of 'hands on' treatment techniques which will help them to restore pain free functional movements in patients.

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Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Define** the terminologies and list the techniques used in manual therapy.	BT 1
CO 2	**Demonstrate** the various techniques of manual therapy keeping the indications and contraindications in mind.	BT 2
CO 3	**Choose** the better technique available out of the rest of manual therapy according to the need and condition of the patient.	BT 3
CO 4	**Analyze** and assess the response of the patient to the given treatment.	BT 4

COURSE: DSE

TITLE OF PAPER: DIAGNOSTIC IMAGING FOR PHYSIOTHERAPISTS

Course Objective

This course aims to study the common diagnostic imaging tests with its indications and implications.
The course covers how X-ray, CT, Ultrasound and other medical images are created and how they help the health professionals to save lives.

Course Outcomes

On successful completion of the course the students will be able to		
SLNo	Course outcome	Blooms Taxonomy level
CO 1	Finding the use of radiographic procedures in diagnosis	BT I
CO 2	To explain the use of CT and MRI with its risks and benefits	BT II
CO 3	Identifying the indications and contraindications of ultrasound	BT III
CO 4	Analysing the various differences in diagnostic imaging procedures by interpretation	BT IV

Level: Semester VI

COURSE: C1

TITLE OF PAPER: NEUROLOGY AND NEUROSURGERY

COURSE OBJECTIVE

To introduce students to acquire knowledge of the describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Neurological and Paediatric conditions

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the different neurological condition.	**BT 1**
CO 2	Learn the pathophysiology of every neurological condition along with its complication	**BT 2**
CO 3	Explain various assessment, tests, communication & medical intervention	**BT 3**

COURSE: C2

TITLE OF PAPER: PHYSIOTHERAPY IN ORTHOPAEDICS CONDITION

COURSE OBJECTIVE

The student with this course outline will be able to know about the various diseases and disorders related to bone. Students will also learn about fractures and how to manage them. They will also be verged in providing treatment and care following orthopaedic impairments

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the different orthopaedics condition.	**BT 1**
CO 2	Learn the pathophysiology of every musculoskeletal condition condition along with its complication and its	**BT 2**
CO 3	Explain various, tests, communication & physiotherapy intervention	**BT 3**

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Course: C2

Title of the Paper: PHYSIOTHERAPY IN ORTHOPAEDICS CONDITION LAB

Course Objectives

- The objectives of this course is to make the students understand the concept of 'hands on' treatment techniques which will help them to restore pain free functional movements in patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the terminologies and list the techniques used in musculoskeletal condition	**BT 1**
CO 2	**Demonstrate** the various special test keeping the indications and contraindications in mind.	**BT 2**
CO 3	**Choose** the better technique available out according to the need and condition of the patient.	**BT 3**

COURSE: DSE

TITLE OF PAPER: PEDITRICS AND PSYCHIATRY

COURSE OBJECTIVE

This course will enable a student to describe etiology, pathophysiology, signs & symptoms & management of the various Neurological and Paediatric conditions.The student will be able to describe normal development &growth of a child, importance of immunization & breast-feeding & psychological aspect of development

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the different neurology and paediatric condition.	**BT 1**
CO 2	Learn the pathophysiology of various condition along with its complication and its medical management	**BT 2**
CO 3	Explain various, tests of various condition	**BT 3**

COURSE: DSE

TITLE OF PAPER: CLINICAL CARDIOLOGY AND PULMONARY DISORDER

COURSE OBJECTIVE

To introduce students to acquire knowledge of the Etiology, Pathophysiology, Signs & Symptoms, Clinical Evaluation & Management of the various Rheumatological, Cardiovascular and Respiratory Conditions.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the different cardiology and pulmonary condition.	**BT 1**
CO 2	Learn the pathophysiology of various condition along with its complication and its medical management	**BT 2**
CO 3	Explain various, tests of various condition	**BT 3**

COURSE: DSE

TITLE OF PAPER: RESEARCH METHODOLOGY & BIOSTATISTICS

COURSE OBJECTIVE

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Describe the role of statistical methods for the design of research in public health & health sciences ,classify population, sample, parameter, sampling frame and statistic	**BT 1**
CO 2	Explain the issues and concepts of research process ,selecting a research problem, selecting an appropriate research design	**BT 2**
CO 3	Lists concepts and procedures of sampling, data collection and reporting.	**BT 3**

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Course: DSE

Title of the Paper: INTRODUCTION TO ORTHOTICS AND PROSTHETICS

Course Objectives

Designed to assess the students to acquire the understanding of the normal physiology of human body and understand the alteration in the physiology for the fabrication of the prosthesis and orthosis.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Explain the terms orthotics and prosthetics.	**BT 1**
CO 2	Understand the nomenclature—the naming of orthoses and prostheses in relation to the joint they support or replace.	**BT 2**
CO 3	Apply and obtain basic understanding of materials.	**BT 3**
CO 4	Analyzing Understanding primarily with the rehabilitation of people with locomotive or neuromuscular disorders.	**BT 3**

Course: DSE

Title of the Paper: INTRODUCTION TO PATIENT QUALITY AND PATIENT SAFETY

Course Objectives

- The objective of the course is to introduce students to the patients quality and patient safety
- Students will able to learn about the management of medical harm, and emergency for patient safety.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	relate the concepts of the term patient quality and patient safety and its management and history	**BT 1**
CO 2	explain the importance of emergency of patient safety in hospital ,and medical harms	**BT 2**
CO 3	apply skills for medical technologies ,and healthcare and prevention for any issues and management any issues	**BT 3**

Course: DSE

Title of the Paper: Allied Therapeutics

Course Objectives

The subject is designed to provide an overview in the basics of Occupational Therapy, Speech and Language Therapy and Alternative Medicine. This will help the student to make decisions during the course of patient evaluation to refer to the concerned specialist for a required therapy.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** Occupational therapy & learn about its principles, effects & role of occupational therapist	**BT 1**
CO 2	**Explain** about basics of speech & language disorders, its various types & rehabilitation	**BT 2**
CO 3	**Understand** the theories, techniques and benefits of various forms of acupuncture	**BT 2**
CO 4	**Outline & understand** various forms of Naturotherapy, Magnetotherapy & Yoga therapy	**BT 2**

Level: Semester VII

Course: C1

Title of the Paper: PHYSIOTHERAPY IN CARDIO RESPIRATORY CONDITION

Course Objectives

The objectives of the course are to introduce students to acquire knowledge about surgical conditions. The course will also allow the students to understand and manage obstretical and gynaecological problems and cardiovascular and respiratory conditions. They will be able to practice application different cardiac and pulmonary rehabilitation tool in human body .

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Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Learn the various cardiorespiratory conditions and its physiology	**BT 1**
CO 2	Understand all the assessment procedure according to the conditions	**BT 2**
CO 3	Apply the knowledge to identify the various conditions based on its signs and symptoms	**BT 3**
CO 4	Analyse various intervention procedures of the condition	**BT 3**

Course: C1

Title of the Paper: PHYSIOTHERAPY IN CARDIO RESPIRATORY CONDITION LAB

Course Objectives

The objectives of the course are to introduce students to acquire knowledge about surgical conditions. The course will also allow the students to understand and manage obstretical and gynaecological problems and cardiovascular and respiratory conditions. They will be able to practice application different cardiac and pulmonary rehabilitation tool in human body .

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Learn the various cardiorespiratory conditions and its physiology	**BT 1**
CO 2	Understand all the assessment procedure according to the conditions	**BT 2**
CO 3	Apply the knowledge about the ICU equipment	
CO 4	Analyse various interpretation procedures of the condition	**BT 3**

Course: DSE

Title of the Paper: PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

Course Objectives

The objectives of this course are to introduce students acquire knowledge about various neurological disorders effecting human body systems and understand the physiotherapy management of the same.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn the various neurological conditions and its physiology**	**BT 1**
CO 2	**Understand all the assessment procedure according to the conditions**	**BT 2**
CO 3	**Apply the knowledge to identify the various conditions based on its signs and symptoms**	**BT 3**
CO 4	**Analyse various intervention procedures of the condition**	**BT 3**

Course: C1

Title of the Paper: PHYSIOTHERAPY IN NEUROLOGICAL CONDITION LAB

Course Objectives

The objective of this course is to make the students understand about the assessment, evaluation and examination of various patients with neurological condition.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Learn the various neurological conditions and its physiology	**BT 1**
CO 2	Understand all the assessment procedure according to the conditions	**BT 2**
CO 3	Apply the knowledge about different approaches	**BT 3**
CO 4	Analyse various intervention procedures of the condition	**BT 3**

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Course: DSE

Title of the Paper: PRINCIPLES OF OCCUPATIONAL THERAPY

Course Objectives

- The objective of the course is to introduce students to the occupational therapy and its importance in various field
- Students will able to learn about the various conditions as well as framing the rehabilitation for the patient.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	relate the concepts of the term to introduce occupational therapy also provides knowledge about the history of occupational therapy and the basic concepts of anatomy and physiology for clinical practice	**BT 1**
CO 2	explain the importance of models , theories and how to frame the rehabilitation for any condition	**BT 2**
CO 3	apply skills to evaluations and treatment planning for various condition and management	**BT 3**
CO 4	Analyze various necessary knowledge of professional conduct and ethics in occupational therapy practice	**BT 4**

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Level: Semester VIII

Course: C1

Title of the Paper: COMMUNITY BASED REHABILITATION

Course Objectives

The objective of this course is that student will be able to have a community based perspective with Physiotherapeutic approach. Student will be able to identify rehabilitation methods to prevent disabilities & dysfunctions due to various disease conditions & plan & set treatment goals & apply the skills gained in rehabilitating & restoring functions.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Idea** about the members of rehabilitation team and their role in Rehabilitating the patient.	**BT 1**
CO 2	**Explain** the assessment of geriatrics, pregnancy & Disability evaluation in various conditions and their rehabilitation.	**BT 2**
CO 3	**Apply** the knowledge Identify the environmental and occupational hazards and their control.	**BT 3**
CO 4	**Provide** physiotherapeutic rehabilitation in various conditions related elderly, pregnancy, industrial worker etc. conditions for relief of pain, relaxation, conditioning and posture in community level.	**BT 3**

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Course: C1

Title of the Paper: COMMUNITY BASED REHABILITATION LAB

Course Objectives

The objectives of the course is to learn various rehabilitation technique from the perspective of the community. The students will also learn how to make lifestyle easy for a disabled person within the patient's limitation at the community level.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the assessments for various conditions.	**BT 1**
CO 2	**Explain** the assessment of geriatrics & others disabled conditions.	**BT 2**
CO 3	**Demonstrate** evaluation of disability or dysfunction seen in the community.	**BT 3**
CO 4	**Apply** their skill of management in rehabilitation in various conditions in community set up.	**BT 3**

Anuradha Das

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Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the necessary preventive measures, handling of live bacteria.	**BT 1**
CO 2	**Demonstrate** the how to dispose infectious waste, care of the equipment requiring safety audit.	**BT 2**
CO 3	**Apply** the theoretical knowledge for patent and copyright	**BT 3**
CO 4	**Analyze** the issue in patent filing and other related issue	**BT 4**

Paper: Microbial Biotechnology

Course objectives:

This course is designed with an objective to provide students about the biotechnology-based application of microbes and their enzymes. The course will also provide the utility of genetically modified microbes in bioenergy and in solving environment related issue.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the important concept of Agriculture Microbiology.	**BT 1**
CO 2	**Demonstrate** the on how microbiology is relevant to technological developments for agriculture and environment	**BT 2**
CO 3	**Apply** the knowledge of recombinant DNA technology is juxtaposed with microbially-based technological developments for agriculture, industry and environment	**BT 3**
CO 4	**Analyze** the current problems related to microorganisms and apply the knowledge in solving the problems related to human health, agriculture	**BT 4**

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Paper : Immunology

Course Objective:

This course is designed to provide knowledge about the immune response in the body along with the basic structure of antigens and antibodies. Further, the syllabus also includes the application of antigens and antibodies in the different serological tests.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concepts about the innate and adaptive immune	**BT 1**
CO 2	Understanding of the antigen, antibody structure, and working mechanism of the Immune system.	**BT 2**
CO 3	**Apply** the knowledge of antigen, antibody, RIA and other techniques in HLA typing and related research	**BT 3**
CO 4	**Analyze** the immune system related disease and other related issues.	**BT 4**

Practical V

Course Objective:

The objective of the course is to familiarize the student with basic practical knowledge regarding different tests related to immune cells and its responses

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concepts the concepts of blood grouping and other related test .	**BT 1**
CO 2	Understanding of the antigen, antibody reaction and working mechanism of the Immune system..	**BT 2**
CO 3	**Apply** apply the practical knowledge to confirm blood group and detection of infectious pathogen	**BT 3**
CO 4	**Analyze** the the sample to understand the infection and disease.	**BT 4**

Paper: Instrumentation and Biotechniques

Course Objective:

The course is developed with the following objectives: To enable the students to develop a proper understanding of different instruments used in microbiological and molecular research. Further, this course will also introduce students to the rapidly evolving field of bioinformatics and biostatistics.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concept of various biotechniques	**BT 1**
CO 2	Understanding the working principles of biotechniques and data analysis	**BT 2**
CO 3	**Apply** the techniques for a better understanding of life functions	**BT 3**
CO 4	**Analyze** of the structure of the protein, DNA, RNA, and other related functions	**BT 4**

Paper : Medical microbiology

Course Objective:

This course is design with an objective to provide the basic information related to bacterial, viral, fungal and protozoan diseases and their diagnosis. Further, this course also provides up to date information regarding different serological and molecular based methods to detect the pathogens involve in causing disease

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concept of pathogenesis and transmission and life cycle	**BT 1**
CO 2	Understanding of normal microflora of human body; role of resident flora. Host-parasite relationships, Infection type	**BT 2**
CO 3	Apply the knowledge of antimicrobial agents and antibiotics as chemotherapeutic agents.	**BT 3**
CO 4	**Analyze** of the Emerging communicable diseases (Plague, Anthrax) and their control.	**BT 4**

Paper : Environmental and Agricultural Microbiology

Course Objective:

To provide students a basic understanding of environmental and agricultural microbiology including; microbial diversity in the environment in relation to environment and agricultural welfare, ecosystem wellness, microbial interactions with pollutants in the soil and environment and the fate of microbial pathogens in the environment and agricultural fields.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concept of microbial diversity biofertilizers and pesticides, microbial waste recycling and bioremediation	**BT 1**
CO 2	Understanding of the microbial interactions with pollutants in the soil and environment and the fate of microbial pathogens in the environment and	**BT 2**
CO 3	apply the knowledge to recognize the ecological problems and critical evaluation of the human impacts on pollution, climate changes and as well as environmental protection	**BT 3**
CO 4	**Analyze** the Emerging problems in current environmental and agricultural issues.	**BT 4**

SYLLABUS (6TH SEMESTER)

Paper: Genetic Engineering		Subject code: MIB152C601
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

This course is design with an objective to provide the basic idea about the genetic manipulation, role of different enzymes used and different techniques involve in the identification and amplification of sperific DNA sequences. Further, this course also provides information regarding basic marker technique used in DNA fingerprinting.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concept of genome organization and omics approaches	**BT 1**
CO 2	Understanding of the replication, Transcription, and mechanism in the cell	**BT 2**
CO 3	apply the knowledge of genome organization in mutation and virulence gene study	**BT 3**
CO 4	Analysis of genetic material to correlate gene mutation and its impact on function	**BT 4**

Paper : Practical VI

Course Objective:

This course is design with an objective to provide the practical knowledge and procedure of genomic and plasmid DNA isolation, primer designing, role of different enzymes used in DNA digestion and different techniques involve in the identification and amplification of specific DNA sequences. Further, this course also provides information regarding gene cloning and mutation.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the basic concept of genome organization and omics approaches	**BT 1**
CO 2	Understanding of the replication, Transcription, and mechanism in the cell.	**BT 2**
CO 3	apply the knowledge of genome organization in mutation and virulence gene study	**BT 3**
CO 4	Analysis of genetic material to correlate gene mutation and its impact on function.	**BT 4**

Paper : Industrial Microbiology

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the basic concept of the suitability of microbes in industrial processes and their source types	**BT 1**
CO 2	Understanding of Batch culture in fermentation, growth kinetics of micro-organisms	**BT 2**
CO 3	apply the knowledge for Continuous culture and scale-up –productivity and product formation	**BT 3**
CO 4	Analysis of the selection, improvement, and maintenance of industrial important strain	**BT 4**

Paper II: Food Microbiology

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the Micro-organisms and their importance in food microbiology – molds, yeast, bacteria	**BT 1**
CO 2	Understanding of the organisms, and different factors those influence microbial growth in food.	**BT 2**
CO 3	apply the knowledge of microbes in Food fermentation – Bread, vinegar, fermented vegetables, fermented dairy products	**BT 3**
CO 4	Analysis of the microbial potential for fermentation and product development	**BT 4**

DSE: Inheritance Biology

Course Objective:

The course is developed with an objective to understand the fundamental principles of Mendelian inheritance, including multiple allelism, lethal alleles, gene interactions, and sex-linked transmission. The course is also designed to enable the students to apply the principles of inheritance as formulated by Mendel and understand basic aspects of the flow of genetic information from DNA to proteins. Further, this course will enable students to understand the structure and its functional role in encoding genetic material.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the basic concept of genetics.	BT 1
CO 2	Understanding the transmission of character from one generation to t generation.	BT 2
CO 3	Apply the Mendelian law and another concept to recognize the genetic disorder	BT 3
CO 4	Analysis Patterns of inheritance of character generation to generation	BT 4

DSE: Pharmaceutical Microbiology

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the concept in Pharmaceutical microbiology, important microbes, and microbial products	BT 1
CO 2	Understanding the basics of pharmaceutical microbiology and ir microorganism playing a role pharmaceutically	BT 2
CO 3	Apply the knowledge to develop the valuable microbial product	BT 3
CO 4	Analysis of the issue in the pharmaceutical industry related to microbes	BT 4

DSE: Microbes in Sustainable Agriculture and Development

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the information about the microbes that play a crucial role in soil formation, Mineralization, and green house gas production	BT 1
CO 2	Understanding the basics of Soil as Microbial Habitat, Soil profile and properties.	BT 2
CO 3	Apply the knowledge to use microbes for the betterment of Agriculture	BT 3
CO 4	Analysis of the issue in the implementation of microbes in agriculture	BT 4

DSE: IPR and Bioethics

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the definition of bioethics, IPR, Function and importance	BT 1
CO 2	Understanding trademark, copy right, trade secreat etc	BT 2
CO 3	Apply the knowledge of to protect copy right and related things	BT 3
CO 4	Analysis of the issue related to patenting the novel things	BT 4

Microbial Quality Control in Water and food

Course Objective:

This course is designed with the objective to provide an overview to students about different methods to study different kinds of Microbes present in water bodies and soil. The course will also provide a basic understanding about the presence of microbes in water bodies such as ponds, river water, ground water and soil such as agricultural land soil and contaminated soil with crude oil.

Course Outcome: On completion of the course the students will be expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the different types of microbes present in water bodies and soil.	**BT 1**
CO 2	understanding the practical aspects of soil and water bodies	**BT 2**
CO 3	Apply various detection methodologies and use to identify beneficial and harmful microbes	**BT 3**
CO 4	Analyze and Identify problems associated with soil and water bodies contaminated with harmful microbes	**BT 4**

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GUWAHATI

Programme Outcomes and Course Outcome

Bachelor of Interior Design

The Assam Royal Global University

Guwahati – 35

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1.1 Nature and extent of the B.I.D. (Bachelor of Interior Design)

Interior design is a multi-faceted discipline that involves a plethora of experiences brought together to orchestrate an end product that is functional and aesthetic in creating spaces. It focuses not merely building something practical but have geared to incorporate practicality coupled with safety and aesthetics for optimum impact.

It allows students to understand and incorporate ideas to create an overall experience and enhancing the quality of built spaces by better utilizing the available space more meaningfully culminating science, art, culture and heritage. This study will bring about the change in the thought process of the students and will gradually start impacting the thought process of society as a whole.

The key areas of study in Interior Design are:

I. Historical perspectives
II. Spatial Design
III. Functional Spaces
IV. Art and Culture
V. Sustainability
VI. Color theory and applications
VII. Light theory and applications
VIII. Data Analysis
IX. Social responsibility
X. Community building

To broaden the interest for interconnectedness between formerly separate disciplines one can choose from the list of Generic electives for example one can opt for economics, physics, chemistry or any other subject of interest offered by different departments and schools of the Assam Royal Global University as one of the GE papers. Skill enhancement Courses enable the student acquire the skill relevant to the main subject. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Communication English and Behavioral Science are compulsory papers for students of B.Des (Interior Design) enable them to be better communicator and develop better personality.

Programme Learning Outcomes in B.I.D. (Bachelor in Interior Design)

Programme Outcomes:

PO1 : Knowledge in Interior Design : Graduate will gain through understanding of Interior Design as collated in the curriculum and developed the capability of its knowledge and it's subsequent disciplines, and its application to one or more disciplines.

PO2 : Critical Thinking : Graduate will gain research acumen and developed critical thinking to carry out research in the domain of Interior Design, analysing projects, collaborating with professionals and prioritize delegated task. Graduates will have the ability of critical thinking in employing foundations of interior design in a certain methodology.

PO3 : Problem Solving : Graduates will have the ability to find potential design solutions in either empty spaces or outdated and dysfunctional space, which meets all the criteria following the purpose of the user using the space, which is achieved through creative and technical skills.

PO4 : Research Related Skills : Graduate will gain the acumen of enquiry and capability of asking appropriate queries and issues, define them and draw inferences ; will have the ability to speak the terminologies required to boost a space's form and function; ability to supervise any turnkey projects from start to finish with the help of effective project management skills including managing budgets, arranging schedules and categorizing risks for each project.

PO5 : Communications skills: Graduate will have the capability to express their concept and their developments of interior design to the clients with the help of examples and sketches, complex and creative ideas in an effective, clear, precise and confident way. Graduate will be able to translate their ideas into approval worthy proposals, meet client's expectation, produce quick hand drawn sketches to establish the process of the ideas pertaining to the projects.

PO6 : Analytical Reasoning : Graduates will gain the ability to measure a space and it's elements and produce the measurements in terms of drawing and design implementations, analyze the space and the measurements and apply them to build and create a functional and aesthetically attractive indoor environment.

PO7 : Information / Digital Literacy : Graduates will gain the digital and software knoeledge by using various design / software tools such as Computer Aided Design (CAD), Sketch Up, Photoshop that helps to produce visual representations of the ideas and the requirements of the clients and the projects in a space.

PO8 : Self Directed Learning : Graduate will have the ability to work independently and conduct in-depth research on different interior design concepts; the capacity to look for appropriate print and digital resources for self-learning and knowledge augmentation in interior design; the capacity to accept assignments with a wide range of requirements, such as the attributes of the space, the project budget pertaining to the client's preferences, which can vary for each design.

PO9 : Futuristic Attitude : Graduates will have the acumen to identify and address innovative architectural trends and styles, understanding of permit requirements and the significance of routine inspections during the design process. Graduates will have the ability of sustaining current with regional, national, and construction codes as well as building supplies that can help keep the project's durability, which involves adhering to building regulations and using materials that are safe and healthy for the occupants of the building.

PO10 : Lifelong learning: Graduates will have the ability to acquire knowledge and skills through self-learning, which aids in both personal growth and skill development to prepare one for ever-changing workplace demands They will be able to identify their own learning needs and choose how they wish to acquire knowledge owing to lifelong learning. In addition, rather than memorization, they will have the acumen to comprehend the nature of knowledge.

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Programme Specific Outcomes :

PSO1 : Graduates will have the acumen and confidence in handling an interior design project entirely from start to finish i.e. from producing ideas to client till handing over the project to the client irrespective of any scope of the project.

PSO2 : Graduates will have the knowledge and ability of documenting and researching different materials used in designing the interior, assess them and have the ability to use them in projects pertaining to the requirements of the client.

PSO3 : Graduates will have the capability of proposing new and futuristic ideas and concepts into different spaces, irrespective of the shape and size of the space, pertaining to the requirements of the client.

PSO4 : Graduates will have the capacity to communicate, propose and deliver confidently with the clients at every stages of the project and will have the ability to direct the client into the right direction in decision making.

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SYLLABUS (1st SEMESTER)

Paper I/Subject Name: Interior Design I

Objectives: The objective of **Interior Design I (IDS132C111)** is to translate knowledge of design principles through enhancement of thought process into a workable design, apply basic design skills & anthropometric observations by actually getting involved with progressively difficult design problems.

Course Outcomes:

After successful completion of the course, student will be able to

- CO1: List the parameters of design anthropometrics and ergonomics, human activity, particulars of scale, materials etc.
- CO2: Summarize the basic design understandings, human functions and their implications for space requirements and circulation of space.
- CO3: Apply basic human functions and their implications for space requirements for a proper design.
- CO4: Analyze of an existing space to identify issues, concerns & design potential.

SYLLABUS (1st SEMESTER)

Paper I/Subject Name: History & Theory of Interior Design – I Subject Code: IDS082C103

Objectives: The objective of **History & Theory of Interior Design – I (IDS132C103)** is to provide the student of Interior Design knowledge on various developments in Interior design through ages.

Course Outcomes:

After successful completion of the course, student will be able to

- CO1: Recall the fundamentals of design
- CO2: Interpret the elements of early Egyptian, Mesopotamian & Greek period.
- CO3: Apply various design theories.
- CO4: Analyze the various history and social context of furniture from different eras.

Adv

SYLLABUS (1st SEMESTER)

Paper IV /Subject Name: Design Rendering

Objective: The objective of the course **Design Rendering, Representation Technique I (Graphics, Art & Photography) (IDS132S113)** is to orient and equip the students with soft skills of Graphics, Art & Photography.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define various materials and tools through visual learning
- **CO2:** Outlining design and craft skill relationship and revel through appreciation of the profession
- **CO3:** Utilizing basic knowledge of architectural drawing with understanding of plans, elevation, sections
- **CO4:** Apply visual drawing and color rendering techniques to create space and depth with drawings and representations of basic forms and space.

SYLLABUS (1st SEMESTER)

Paper II/Subject Name: Elements of Design

Objectives: The objective of **Elements of Design (IDS132C112)** is to develop an understanding of elements of design in abstract and application of Principles of Design in order to create an aesthetically pleasing & creative design.

Course Outcomes:

After successful completion of the course, student will be able to

- CO1: List the basic design elements, build a design vocabulary and use it in compositions.
- CO2: Compare Visual and tactile design elements and its impact on the mind of the viewer or a user.
- CO3: Apply design principles such as ratio, proportion, scale, balance, harmony, unity, variety, rhythm, emphasis.
- CO4: Analyze the design process to create a creative and stimulating form/space, using the basic strategic knowledge and tactics of; structure, line, form, space, lighting and shape.

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SYLLABUS (1st SEMESTER)

Paper II /Subject Name: Workshop I

Objective: The objective of the course **Workshop I (IDS132G111)** is to give an introduction to the basic principles governing structural systems.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define basic knowledge of working with structural materials
- **CO2:** Interpret the techniques of planning, chiseling, pasting, fixing & welding to learn the use of hand tools.
- **CO3:** Make use of practical usage of equipment's, processes and its application.
- **CO4:** Discover skill in creating designs and making art objects

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Interior Design II (Residential)

Objective: The objective of the course **Interior Design II (IDS132C211)** is to translate knowledge of abstract design principles through enhancement of thought process into a workable design for a residence.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define adequate facilities for work, relaxation, comfort, privacy, aesthetics, and maintenance through design and proper choice of materials, services, fittings and fixtures in interiors of residences
- **CO2:** Show design skills within the constraints of a given interior design project brief
- **CO3:** Utilize the Design Studio to gain hands on experience and understand basic infrastructural requirements
- **CO4:** Analyze critically a Residential space with a design eye and come up with strategic design solutions

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SYLLABUS (2nd SEMESTER)

Paper II/Subject Name: Building Construction

Objective: The objective of the course **Building Construction & Materials I (IDS132C211)** is to impart the fundamental concepts, technicalities of building construction and material and to apply the methods in the practical field.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Relate concepts of building construction methods and techniques used in doors and windows.
- **CO2:** Understand construction material used in building industry for different doors and windows.
- **CO3:** Apply different techniques and material knowledge.
- **CO4:** Analyze various techniques and ideas of doors and windows in the practical field.

SYLLABUS (2nd SEMESTER)

Paper III /Subject Name: Three-Dimensional Graphics

Objective: The objective of the course **Three-Dimensional Graphics (IDS132C213)** is to orient and familiarize the students towards the principles of Design thinking, Visualization and representation with drawing materials and equipment.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Choose rendering techniques for representing 2D and 3D drawings
- **CO2:** Demonstrate Sciography, Human figures and accessories in 2D and 3D drawings.
- **CO3:** Apply Learning of measure drawing with basic knowledge and understanding of Isometric, Oblique, Axonometric projections
- **CO4:** Take part in Practical orientation through exercises dealing with sections of solids, simple and complex.

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Design Rendering & digital Representation Technique II

Objectives: The objective of **Design Rendering & digital Representation Technique II (IDS132S211)** is to translate knowledge of abstract design principles through enhancement of thought process into a workable design and acquire knowledge of principles of Interior Design for residential spaces.

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Relate Practical Design Layouts & Technical Drafting

CO2: Classify the Factors to be Considered While Designing Interiors.

CO3: Plan Furniture requirements in the interior spaces.

CO4: Analyze Floor Layouts & Sectional Elevations of the Different Interior Spaces.

SYLLABUS (2ND SEMESTER)

Paper I/Subject Name: Workshop II

Objective: The objective of the course **Workshop II (IDS132M216)** is to translate knowledge of various techniques of treating a wall surface with hands on experience.

Course Outcome:

On completion of this course, students will be able to

CO1: How to design and create wall murals.

CO2: Illustrate various techniques of treating a wall surface, planning, chiseling, pasting, fixing & welding.

CO3: Utilize the application of hands-on tools.

CO4: Discover a final product based on the learning.

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SYLLABUS (2ND SEMESTER)

Paper II/Subject Name: GE 2 (Open) Colour Theory and It's Application

Objectives: To introduce students to the concept of application of colours and to understand the judicious use of colours in interior design.

Course Outcomes:
After successful completion of the course, student will be able to

- **CO1:** Show understanding of the evolution of color theory and learn color terminology/vocabulary and how to communicate/define color.
- **CO2:** Relate to the psychological effects of color.
- **CO3:** Identify various color systems and the ways they are applied today.
- **CO4:** Examine various occurrences and uses of color in nature, art, architecture, fashion/textiles, film, interior design, graphic design and photography.

SYLLABUS (3rd SEMESTER)

Paper /Subject Name: Interior Design III (Office)

Objective: The objective of the course **Interior Design III (IDS132C311)** is to critically analyse an office space with a design eye and come up with strategic design solutions

Course Outcome:
On completion of this course, students will be able to.

- **CO1:** Show design skills within the constraints of a given interior design project brief.
- **CO2:** Illustrate adequate facilities for work, relaxation, comfort, privacy, aesthetics, and maintenance through design.
- **CO3:** Organize design with the help of presentation drawings.
- **CO4:** Analyze proper materials, services, fittings and fixtures in a designed office interior space.

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SYLLABUS (3rd SEMESTER)

Paper II/Subject Name: Building Construction and Material II

Objective: The objective of **Building Construction and Material II** is to impart the fundamental concepts, technicalities of building construction and material and to apply the methods in the practicality of the field.

Course Outcomes:

After successful completion of the course, student will be able to

- **CO1:** Remember concepts of building construction methods and techniques used in paneling and partitions.
- **CO2:** Understand construction material used in building industry for different partitions and paneling.
- **CO3:** Apply different techniques and material knowledge.
- **CO4:** Analyze various aspects of partitions and paneling in the practical field.

SYLLABUS (3rd SEMESTER)

Paper /Subject Name: Furniture Design I

Objective:

The objective of the course **Furniture Design I (IDS132D311)** is to design furniture for different rooms/spaces of the residence designed in 2nd Semester.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** How to design and create furniture pieces for different residential spaces understanding its relation to human movements.
- **CO2:** Demonstrate the multiple use of furniture for different residential spaces keeping the constraints of available space in consideration.
- **CO3:** Develop principles that will help one to judge the design of furniture for different residential spaces in relation to their functionality and aesthetics.
- **CO4:** Analyze the use of contextually appropriate materials, colour scheme, texture, joinery details to care & maintain the furniture for different residential spaces with various finishes.

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SYLLABUS BID 3RD SEMESTER

Paper III /Subject Name: Measure Drawing

Objective: The objective of the course **Measure Drawing (IDS132D312)** is to have knowledge about Practical orientation towards Interior Design of Offices by Measure Drawing and to study of Materials used for interior of offices.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Relate the measurements of an interior of an office space in Live CaseStudy as well as Online and journal Study
- **CO2:** Demonstrate with Technical layout, Drafting and Practical Drawing and Design skills
- **CO3:** Apply knowledge about various Materials in the market.
- **CO4:** Analyze about different Lights and Fixtures available in the market.

SYLLABUS (BID 3RD SEMESTER)

Paper IV/Subject Name: Ergonomics & Human Behaviour

Objective:

The objective of the course **Ergonomics & Human Behaviour (IDS132G301)** is to design furniture and workspaces according to the human scale/ proportions and their ergonomic aspects promoting good health and posture.

Course Outcome:

On completion of this course, students will be able to –

- **CO1:** Define basic human factors, anthropometrics and ergonomics in daily life.
- **CO2:** Demonstrate an ability to understand the importance of human factors, human proportions in interior design.
- **CO3:** Apply theories of proportion, ergonomic principals, and anthropometrical data of various activities for design development.
- **CO4:** Examine interior work systems and relate other components of the built environment to interior design human factors.

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SYLLABUS (BID 3RD SEMESTER)

Paper V/Subject Name: GE 2 (Open) - Bamboo & Cane crafts of North-East India

Objectives: The objective of the course **Bamboo & Cane crafts of North-East India (IDS132G312)** is to expose students to different types of indigenous bamboo and cane crafts of North-east India.

Course Outcomes:
After successful completion of the course, student will be able to

- **CO1:** Understand the intricate structure and the subtle behaviour of the materials, Bamboo & Cane, as applied to the construction of numerous product categories.
- **CO2:** Understand how daily use products are an outcome of a complex interplay of culture & technology, as understood by the people of North-eastern region of India.
- **CO3:** Develop concept of different joineries & different weaving patterns of the material.
- **CO4:** Classify and observe local crafts surrounding us.

SYLLABUS (4TH SEMESTER)

Paper I/Subject Name: Interior Design-IV (Commercial)		**Subject Code: IDS082C411**
L-T-P-C: 0-0-8-4	**Credit Units: 4**	**Scheme of Evaluation: S**

Objectives: The objective of **Interior Design (IDS132C411)** is to study and develop innovative design schemes for Hospitality industry.

Course Outcomes:
After successful completion of the course, student will be able to

- CO1: Show innovative ideas for restaurant and hotel interiors. Knowledge of working drawings is also intended.
- CO2: Illustrate creative and practical design skills for creating interior space
- CO3: Identify the criteria for selection of appropriate material for different surfaces taking into consideration of ergonomic factors, aesthetics and cost
- CO4: Analyze a space with a design eye and come up with strategic design solutions.

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SYLLABUS (4thSEMESTER)

Paper II/Subject Name: Building Construction & Materials III

Objectives: The objective of the subject is to introduce students to the technicalities of building construction and material and to acquaint with various methods of construction.

Course Outcomes:

After successful completion of the course, student will be able to

- **CO1:** Tell the parameters of design and techniques of construction.
- **CO2:** Summarize the basic design understandings and understand the practicality of design execution.
- **CO3:** Apply basic RCC and related construction illustrations for a proper design.
- **CO4:** Analyze the different types of structural construct and differentiate the minute details of the same efficiently.

SYLLABUS (4th SEMESTER)

Paper III/Subject Name: Furniture Design II

Objective:

The objective of the course **Furniture Design II (IDS132D411)** is to design furniture for different rooms/spaces of the office/corporate workspace designed in 3rd Semester.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Name furniture pieces for different office/corporate workspaces understanding its relation to human movements.
- **CO2:** Demonstrate the multiple use of furniture in office/corporate workspaces keeping the constraints of available space in consideration and for multiple stakeholders involved.
- **CO3:** Develop principles that will help in creating modular design of furniture for office/corporate workspace and one to judge the design of furniture in relation to their functionality and aesthetics.
- **CO4:** Analyze the use of contextually appropriate materials, colour scheme, and texture, joinery details to care & maintain the furniture designed specifically for office /corporate workspaces with various finishes.

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SYLLABUS (4th SEMESTER)

Paper III/Subject Name: Vaastu in Interiors

Objective:
The objective of the course **Vaastu in Interiors (IDS132D412)** is to familiarize students with various Vaastu Principles and its application in the field of Interior Design.

Course outcome:

On completion of this course, students will be able to:

- **CO1:** Recall various concepts of Vaastu Shastra and its relation to human beings.
- **CO2:** Illustrate various philosophies, principles of Vaastu and its importance in practical field.
- **CO3:** Apply various principles of Vaastu in residential, commercial buildings etc.
- **CO4:** Take part in detailed planning of a Residence with respect to vaastu principles.

SYLLABUS (4th SEMESTER)

Paper IV/Subject Name: Computer Application (SketchUp)

Objectives: The objective of **Computer Application (IDS132S411)** to develop skills in the Software SketchUp and provide basic and advanced 3D models.

Course Outcomes:
After successful completion of the course, student will be able to

- **CO1:** Show computational skills for the production of 3D models.
- **CO2:** Relate drawing aids and equipment along with learning to computerize design drawings.
- **CO3:** Model an object or space and represent it graphically and digitally.
- **CO4:** Examine how digital design software is used in the industry for the production of 3D models.

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Syllabus (4TH Semester)

Paper II/Subject Name: GE 1- Model Making Workshop

Objective: The objective of **Model Making Workshop (IDS132G411)** is to impart the fundamental concepts, technicalities of creating 3D scaled models and to apply the methods in the practicality of the field.

Course Outcomes:
After successful completion of the course, student will be able to

- **CO1:** Remember concepts of 'Semi detailed' and 'Detailed' model making techniques.
- **CO2:** Understand various materials to create scaled models.
- **CO3:** Apply different techniques and material knowledge.
- **CO4:** Analyze various aspects of model making in the practical field.

SYLLABUS (5th SEMESTER)

Paper /Subject Name: Interior Design V (5 Star Hotel)

Objective: The objective of the course **Interior Design V (IDS132C511)** is to translate knowledge of abstract design principles through enhancement of thought process into a workable design for a 5 star hotel.

Course Outcome:
On completion of this course, students will be able to

- **CO1:** Define adequate facilities for work, relaxation, comfort, privacy, aesthetics, and maintenance through design and proper choice of materials, services, fittings and fixtures in interiors of 5 star hotels.
- **CO2:** Summarize design skills and requirements within the constraints of a given interior design project brief.
- **CO3:** Make use of the Design Studio to gain hands on experience and understand basic infrastructural requirements
- **CO4:** Analyze the space with a design eye and come up with strategic design solutions.

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SYLLABUS (5th SEMESTER)

Paper III/Subject Name: Building Construction and Materials IV

Objective: The objective of **Building Construction and Materials IV** is to impart the fundamental concepts, technicalities of creating 3D scaled models and to apply the methods in the practicality of the field.

Course Outcomes:

After successful completion of the course, student will be able to

- **CO1:** Remember concepts of building construction methods and techniques used in Doors, Windows, advanced partitions and Ceilings.
- **CO2:** Understand construction material used in building industry for pest controlling treatments and water proofing
- **CO3:** Apply different techniques and material knowledge.
- **CO4:** Analyze various aspects of MS and aluminum doors windows, partitions and ceiling in the practical field.

SYLLABUS (5TH SEMESTER)

Paper III/Subject Name: Building Services I

Objectives: The objective of Building Services II is to develop the knowledge and skills required for understanding the water supply and sanitation services in buildings and their integration with architectural design.

Course Outcomes:

After successful completion of the course, student will be able to

- CO1: Relate the technical knowledge regarding water supply and sanitation system in a building. .
- CO2: Demonstrate the principles and best practices for Solid waste management in residential unit.
- CO3: Apply the principles of sanitation, Introduction to various sanitary pipes, joints, fittings and fixtures, their function, placement and constructional details.
- CO4: Inference the knowledge into sheet work.

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SYLLABUS BID (5th SEMESTER)

Paper /Subject Name: DSE-II – Material Documentation

Objective: The objective of the course **DSE-II – Material Documentation (IDS132D516)** are:

1. To understand the various components of interior spaces and familiarize the students of Interior Design on materials and construction methodology.

Course Outcome:

On completion of this course, students will be able to

CO1: Define knowledge and technicality about different aspects of Flooring, flooring materials used in interior spaces, and implementation/construction of flooring in interior spaces and establish the know-how of various materials & techniques are used for treatments & proofing the Interiors of any built-space.

CO2: Demonstrate technicality about different aspects and types of Ceilings, suspended ceiling materials used in interior spaces, and implementation/construction of suspended ceilings in interior spaces and establish the know-how of various materials, techniques, components and check list used for selection & fire - proofing the ceilings of Interiors of any built-space.

CO3: Select various External Finishes in the market such as Glazing materials and assembles, coatings and sealants along with waterproofing materials.

CO4: Distinguish about different internal Finishes in the market such as coatings, their types and uses and selection checklist.

SYLLABUS (6th SEMESTER)

Paper I/Subject Name: Interior Design VI (Auditorium/ Theatre)

Objective: The objective of Interior Design VI is to study and develop innovative schemes for auditorium, seminar halls, lecture halls etc. and also to give them exposure to design standards in auditoriums & similar public spaces and understanding of visual and acoustic parameters.

Course Outcome:

On completion of this course, students will be able to

CO1: Define visually and will be proficient at analytical thinking, conceptualization and the problem-inquiry, solution cycle.

CO2: Summarize and discuss the interior environment in the context of the exterior.

CO3: Develop the design with the importance of presentation drawings.

CO4: Analyze a sense of aesthetics and fundamental understanding of vision & sound and use a variety of drawing media to effectively communicate design solutions.

SYLLABUS (6TH SEMESTER)

Paper II/Subject Name: Working Drawing

Objectives: The objective of Working Drawing is to enable the students to learn the techniques of preparing drawing which are used for construction of buildings

Course Outcomes:

After successful completion of the course, student will be able to

CO1: Relate the technical details to the drawings such that it can be implemented by the workers in the site

CO2: Compare the sense of technical base for the execution of the designer's ideas.

CO3: Develop understanding of how to make technical drawings explaining to the workmen how execute the design in actual.

CO4: Inference the technical knowledge into presentation drawings.

SYLLABUS (6TH SEMESTER)

Paper III/Subject Name: Building Services II

Objective: The objective of **Building Services II** is to impart the fundamental concepts, technicalities of building services and to apply the methods in the practicality of the field.

Course Outcomes:

After successful completion of the course, student will be able to:

CO1: Remember concepts of design, installation, operation and monitoring of the electrical services, lifts and escalators in residential and commercial buildings.

CO2: Understand installation techniques of electrical services, lifts and escalators used in building industry.

CO3: Apply different techniques and technical knowledge.

CO4: Analyze various aspects of operations and monitoring in the practical field.

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SYLLABUS (6th SEMESTER)

Paper IV/Subject Name: Acoustics

Objective: To develop the knowledge and skills required for understanding acoustics in building and its integration with Interior design.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** List Acoustical design requirements for different enclosed spaces e.g. halls, theatres, classrooms etc.
- **CO2:** Relate Acoustics with Architecture and the behavior of sound in an enclosed space.
- **CO3:** Apply the use of various material and its applications.
- **CO4:** Analyze the sense of aesthetics and fundamental understanding of vision & sound

SYLLABUS (6th SEMESTER)

Paper V/Subject Name: Project Management

Objective: The objective of the course **Project Management (IDS132G605)** is to expose the students to the currently prevalent techniques in the planning, programming and management of a project.

Course Outcome:

On completion of this course, students will be able to:

- **CO1:** Relate the knowledge of fundamentals of project management with the help of graphical guidelines of networks and events, which will greatly enhance the professional ability of an Interior Designer.
- **CO2:** Relate the knowledge of the methodology of executing a Project with the concepts of planning, scheduling and controlling which will greatly enhance the professional ability of an Interior Designer.
- **CO3:** Develop the knowledge of Project Monitoring which will enhance in assessing the costs and risks of projects.
- **CO4:** Categorize about different Project Contracts, types and documents and the management and also have the knowledge about Tenders and tendering documents.

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SYLLABUS (6th SEMESTER)

Paper /Subject Name: Rendering and Post Production Software

Objective: The objective of the course **Rendering and Post Production Software** is to equip the students with skills required in using computer as a digital media for design and preparation of 3D images of Interior drawings and structures.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define Graphic tools to understand the elements of a building.
- **CO2:** Outline the application of technology and construction as part of the design process.
- **CO3:** Apply graphic representation via computing tools / methods.
- **CO4:** Examine how digital design software is used in the industry for the production of accurate and detailed interior and architectural drawings.

SYLLABUS (7th SEMESTER)

Paper /Subject Name: Interior Design VII (Health Care)

Objective: The objective of the course **Interior Design VII (IDS132C711)** is to develop the skills for designing healthcare spaces and environments.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define design skills within the constraints of a given interior design project brief.
- **CO2:** Explain the design along with the importance of presentation drawings.
- **CO3:** Organize adequate facilities for healthcare, care givers, work, relaxation, comfort, privacy, aesthetics, and maintenance through design
- **CO4:** Categorize proper materials, services, fittings and fixtures in a designed healthcare interior space.

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SYLLABUS (7th SEMESTER)

Paper II/Subject Name: Estimation, Costing & Tendering

Objectives: The objective of **Estimation, Costing & Tendering (IDS132C703)** is to develop the necessary skills for estimation and writing specifications for various types of building interiors, development and tendering work with finding out the costs for projects.

Course Outcomes:

After successful completion of the course, student will be able to

- **CO1:** Define various terminologies related to estimation.
- **CO2:** Illustrate an understanding on the methods to be used for performing an estimation based on learning's.
- **CO3:** Apply various methods of estimation to find the cost of projects.
- **CO4:** Dissect the process of tendering and bidding based on proper estimation.

SYLLABUS (7th SEMESTER)

Paper II/Subject Name: Illumination

Objectives: The objective of **Illumination (IDS132C702)** is to develop insight into the factors to be considered while planning the lighting of a space, to learn to evaluate the illumination available at task in relation to different activities and plan appropriate lighting in different spaces, and know the effect of light and colour together on interior spaces.

Course Outcomes:

After successful completion of the course, student will be able to

- **CO1:** Define various terminologies related to lighting and illumination.
- **CO2:** Illustrate an understanding on the methods quantity and quality of illumination.
- **CO3:** Apply various methods of lighting types and luminance in various projects.
- **CO4:** Analyze the types of lighting fixtures for indoors and outdoors spaces and areas.

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SYLLABUS (7th SEMESTER)

Paper III/Subject Name: Minor Project

Objective:

The objective of the course **Minor Project (IDS132C712)** is to integrate the learning of the current semester which will establish the research component that leads to thesis in next semester.

Course Outcome:

On completion of this course, students will be able to –

- **CO1:** Define research area, with a formulated aim, objections, scope, and limitations of the study.
- **CO2:** Demonstrate basic research principles and research methods, report writing skills and dissertation writing.
- **CO3:** Apply strong theoretical foundation, clarity of thought to orient the study to structured research.
- **CO4:** Examine this research and use the same for pre-design study, amounting to literature review and relevant case studies for next semester.

SYLLABUS (8th SEMESTER)

Paper /Subject Name: Startup, Ventures & Entrepreneurship

Objective:

The objective of the course **Start Up Ventures and Entrepreneurship (IDS132C801)** is to inculcate entrepreneurship and encourage innovative thinking for start-ups.
It also aims to promote self-employment and encourage creative thinking to start one's own business.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define entrepreneurship and start-up ventures and terms related with it.
- **CO2:** Demonstrate the possibilities of being self-dependent and aiding in the economic growth of the country.
- **CO3:** Develop understanding of market and govt. policies promoting entrepreneurship.
- **CO4:** Discover organizational relations and their impact on building start-ups and entrepreneurship setups.

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SYLLABUS (8th SEMESTER)

Paper /Subject Name: Major Project

Objective: The objective of the course **Major Project (IDS132C822)** is to translate knowledge of abstract design principles through enhancement of thought process into a workable design and showcasing that for a final complete project.

Course Outcome:

On completion of this course, students will be able to

- **CO1:** Define adequate facilities for work, relaxation, comfort, privacy, aesthetics, and maintenance through design and proper choice of materials, services, fittings and fixtures in interiors.
- **CO2:** Develop design skills within the constraints of a given interior design project and showcase its complete design language to completion
- **CO3:** Utilize the time to showcase hands on experience and understanding of basic infrastructural requirements
- **CO4:** Analyze critically with a design eye and come up with strategic design solutions

Anuradha Devi

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GUWAHATI

Programme Outcomes and Course Outcome

BA-Psychology

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd : 2018

Anuradha Deb

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1.2.1 Nature and Extent of Bachelor's Degree Programme in Psychology/Applied Psychology (Honours)

A bachelor's degree in Psychology/Applied Psychology with Research is a 4 years degree course which is divided into 8 semesters as under.

Sl. No.	Type of Award	Stage of Exit	Mandatory Credits to be secured for the Award
1	Certificate in the Discipline	After successful completion of 1st Year	48
2	Diploma in the Discipline	After successful completion of 1st and 2nd Years	96
3	B.A. (H) in Applied Psychology	After successful completion of 1st, 2nd and 3rd Years	148
4	B.A (Honours with Research) in Applied Psychology	After successful completion of 1st , 2nd, 3rd and 4th Years	180

A student pursuing 4 years undergraduate programme with research in a specific discipline shall be awarded an appropriate Degree in that discipline on completion of 8th Semester if he/she secures 180 Credits. Similarly, for certificate, diploma and degree, a student needs to fulfill the associated credits. An illustration of credits requirements in relation to the typeof award is illustrated below:

Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

Bachelor's Degree (Honours) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field ofstudy/profession. Thus, BA (Honours) Course in Psychology/Applied Psychology aims to equip students to qualify forjoining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

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Programme learning outcomes relating to B.A. (Honours) degree programme in Applied Psychology

Programme Outcomes

PO-1: Knowledge of Psychology

(i) A systematic or coherent understanding of the academic field of Psychology, its different learning areas and applications, and its linkages with related disciplinary areas/subjects;

(ii) Procedural knowledge that creates different types of professionals in various areas like research and development, teaching and government and public service;

(iii) Skills in areas related to specialization area relating to the subfields and current developments in the academic field of Psychology.

PO2: Communications skills:

Capability to express various concepts of Psychology in effectively in writing and speaking.

PO3: Critical thinking

i) Ability to employ analytic thought to a body of knowledge and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence.

PO4: Problem solving:

Capacity to use the earned knowledge to solve different non-familiar problems and apply the learning to real world situations.

PO5: Analytical thinking:

Ability to inculcate inductive and deductive reasoning; to comprehend the basic structure and interrelationship; to deduct inferences of various concept of psychology.

PO6: Research-related skills:

Potentiality to think and inquire about relevant/appropriate questions, ability to define problems, formulate and test hypotheses, formulate mathematical arguments and proofs, draw conclusions; ability to write the obtained results clearly.

PO6: Cooperation/Team work:

Ability of working effectively in diverse teams in both classroom and field-based situations.

PO8: Information Literacy/ Digital literacy:

Ability to use computers in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant informationsources and use appropriate software for analysis of data.

PO9: Moral and ethical Learning

Capable of conducting their work with honestyand precision thus avoiding unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, and appreciating environmental and sustainability issues.

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PO10: Life Long Learning

Ability to earn knowledge and skills through self-learning that helps in personal development as well as skill development to make them suitable for changing demands of work place.

1.6 Programme Specific Outcomes

PSO 1: Moral and ethical awareness and reasoning involving objective and unbiased work attitude, avoiding unethical behaviours such as data fabrication and plagiarism, observing code of conduct, respecting intellectual property rights and being aware of the implications and ethical concerns of research studies.

PSO 2: Commitment to health and wellbeing at different levels (e.g. individual, organization, community, society).

PSO 3: Developing positive attributes such as empathy, compassion, social participation, and accountability.

PSO 4: Appreciating and tolerating different perspectives.

Subject Name: Introduction to Psychology I

Objective: The objective of **Introduction to Psychology I (PSY062C101/APY062C101)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and theories in Psychology.	BT1
CO2	**Understand** the fundamental processes underlying human behavior such as sensation, perception, memory, motivation, emotion, individual differences.	BT2
CO3	**Apply** the principles of psychology in day-to-day life for a better understanding of themselves and others	BT3
CO4	**Analyze** the concept of individual differences in examining human mental processes	BT4

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Subject Name: Introduction to Social Psychology

Objective: The objective of **Introduction to Social Psychology I (PSY062C102/APY062C102)** is to understand the basic nature concept of social psychology.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and theories of Social Psychology.	BT1
CO2	**Understand** the social influences on Human Behaviour	BT2
CO3	**Apply** the principles of attributions and biases in day-to-day life	BT3
CO4	**Analyze** the role of cognition in Social Psychology.	BT4

Subject Name: Statistics in Psychological Research I

Objective: The objective of **Statistics in Psychological Research I (PSY062C103/APY062C103)** is to introduce students to the basic concepts of statistics with an emphasis on its application in psychological research.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the importance of Statistics in Psychological Research	BT1
CO2	**Describe** the various methods of statistics	BT2
CO3	**Application** of the principles of statistics in Social Sciences researches	BT3
CO4	**Analyze** raw data and draw logical conclusion	BT4

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Subject Name: Life Skills

Objective: The objective of **Life skills (PSY062S101)** is to introduce students to the basic concepts and importance of life skills

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recalling** the meaning and importance of life skills	BT1
CO2	**Understand** the various types of life skills	BT2
CO3	**Apply** the various life skills specific to the situation.	BT3
CO4	**Analyze** concepts of various types of life skills	BT4

Subject Name: Introduction to Psychology I

Objective: The objective of **Introduction to Psychology I (PSY062G101)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and theories in psychology.	BT1
CO2	**Understand** the fundamental processes underlying human behavior such as sensation, perception, memory, motivation, emotion, individual differences.	BT2
CO3	**Apply** the principles of psychology in day-to-day life for a better understanding of themselves and others	BT3
CO4	**Analyze** the concept of individual differences in examining human mental processes	BT4

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Subject Name: Understanding and Managing Mental Health

Objective: The objective of **Understanding and Managing Mental Health (PSY062G102)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and theories in psychology.	BT1
CO2	**Understand** the basis of psychological disorders	BT2
CO3	**Apply** the principles of psychology in day-to-day life for a better understanding of themselves and others	BT3
CO4	**Distinguish** among the various types of psychological disorders	BT4

Subject Name: Introduction to Psychology II

Objective: The objective of **Introduction to Psychology II (PSY062C201/APY062C201)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and Theories in psychology.	BT1
CO2	**Understand** the fundamental processes underlying human behavior such as intelligence, personality, individual differences.	BT2
CO3	**Apply** the Principles of Psychology in day-to-day life for a better understanding of themselves and others	BT3
CO4	**Analyze** theoretical perspectives, and empirical findings that address psychology.	BT4

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Subject Name: Developmental Psychology

Objective: The objective of **Developmental Psychology (PSY062C202 /APY062C202)** is to make the students understand the role of family, peers and community in influencing development at different stages.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the importance of life span development.	BT1
CO2	**Understand** the various stages of development.	BT2
CO3	**Apply** the principles of psychology in human development	BT3
CO4	**Differentiate** the psychological needs of each stage of development.	BT4

Subject Name: Statistics in Psychological Research II

Objective: The objective of **Statistics in Psychological Research II (PSY062C203/APY062C203)** is introduce students to the basic concepts of statistics to be applied in the field of psychology.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the importance of statistics in psychological research	BT1
CO2	**Describe** the various methods of statistics	BT2
CO3	**Application** of the principles of statistics in Social Science Researches	BT3
CO4	**Analyze** raw data and draw logical conclusion	BT4

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Subject Name: Psychological Testing

Objective: The objective of **Psychological Testing (PSY062S211)** is to familiarize students with the application of psychological testing.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** psychological testing.	BT1
CO2	**Understand** the importance of psychological test construction.	BT2
CO3	**Application** of the psychological testing	BT3
CO4	**Analyze** the findings of various psychological testings	BT4

Subject Name: Introduction to Psychology II

Objective: The objective of **Introduction to Psychology II (PSY062G201)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the key concepts and theories in psychology.	BT1
CO2	**Understand** the fundamental processes underlying human behavior such as intelligence, personality, individual differences.	BT2
CO3	**Apply** the principles of psychology in day-to-day life for a better understanding of themselves and others	BT3
CO4	**Analyze** the concept of altered mental states	BT4

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Subject Name: Psychology for Health & Wellbeing

Objective: The objective of **Psychology for Health & Wellbeing (PSY062G102)** is to introduce students to the basic concepts of health psychology.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the concept of health psychology	BT1
CO2	**Understand** the sources of stress	BT2
CO3	**Apply** the different types of coping mechanisms to deal effectively with stress.	BT3
CO4	**Examine** the human strengths and virtues	BT4

Subject Name: Abnormal Psychology I

Objective: The objective of **Abnormal Psychology I (PSY062C301/APY0623101)** is to introduce students the aspects of psychopathology

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** abnormal behaviour	BT1
CO2	**Understand** different types of psychological disorders	BT2
CO3	**Apply** different types of treatment to deal with the disorders	BT3
CO4	**Analyse** the different types of treatment methods specific to the disorder	BT4

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Subject Name: Development of Psychological thought

Objective: The objective of **Development of Psychological thought (PSY062C302)** is to provide a basic introduction to the development of the discipline both from the Indian as well as western perspective.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different approaches to psychology	BT1
CO2	**Identifying** the diversity of contributions to the contemporary fields of psychology	BT2
CO3	**Application** of different perspective to understand the behaviour	BT3
CO4	**Comparison** of eastern and western perspectives	BT4

Subject Name: Applied Psychology

Objective: The objective of **Applied Psychology (APY062C302)** is to introduce different domains of applied psychology and understand the application of psychology in different sectors.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of psychology	BT1
CO2	**Understanding** the different branches of psychology	BT2
CO3	**Application** of psychological principles in different branches	BT3
CO4	**Analyse** human behaviour from the perspectives of different branches	BT4

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Subject Name: Positive Psychology

Objective: The objective of **Positive Psychology (PSY062D301/APY062D301)** is to equip the students with the skill and competence to apply positive psychology principles in a range of environments to increase individual and collective wellbeing.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** positive psychology, health psychology, development psychology and clinical psychology	BT1
CO2	**Understand** human strengths and virtues	BT2
CO3	**Apply** the principles of positive psychology in real life situation	BT3
CO4	**Examine** the importance of self control and personal goal	BT4

Subject Name: Educational Psychology

Objective: The objective of **Educational Psychology (PSY062D302/APY062C302)** is to introduce the application of psychological principles and theories in the discipline of education.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the branches of psychology.	BT1
CO2	**Understand** the nature of educational psychology.	BT2
CO3	**Use** the psychological principles to understand the discipline of education.	BT3
CO4	**Examine** the different classroom management skills	BT4

Subject Name: Organizational Behaviour I

Objective: The objective of **Organizational Behaviour I (PSY062G301)** is to introduce students the role of group and team in organization.

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of organizational behaviour	BT1
CO2	**Understand** the importance of group and team work	BT2
CO3	**Apply** the psychological principles in work setting	BT3
CO4	**Analyses** the effectiveness of different types of leadership styles	BT4

Subject Name: Abnormal Psychology II

Objective: The objective of **Abnormal Psychology II (PSY062C401/APY062C401)** is to make the students understand various behavioral dysfunctions and use the same in day-to-daylife

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** different types of psychological disorder	BT1
CO2	**Understand** the criteria for psychological disorders	BT2
CO3	**Apply** different types of treatment to deal with the disorders	BT3
CO4	**Analyse** the different types of treatment methods specific to the disorder	BT4

Subject Name: Psychological Research

Objective: The objective of **Psychological Research (PSY062C402/APY062C402)** is to educate students with the process and the methods of quantitative and qualitative psychological research traditions.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the importance of research	BT1
CO2	**Understand** different research methods for Social Science Research	BT2
CO3	**Apply** different research methods in Social Science Research	BT3
CO4	**Analyse** social science data by using different research methods.	BT4

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Subject Name: Youth, Identity and Gender Psychology

Objective: The objective of **Youth, Identity and Gender Psychology (PSY062D401/APY062C401)** is to introduce the students with an understanding of the concepts of youth, identity and gender and their issues related to identity formation.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of youth.	BT1
CO2	**Understand** the influences of society in forming identity	BT2
CO3	**Apply** the parent-child relationship in forming identity	BT3
CO4	**Analyze** the influences of globalization in forming identity.	BT4

Subject Name: Community Psychology

Objective: The objective of **Community Psychology (PSY062D402/APY062D402)** is to develop a community based orientation towards mental health.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of community psychology.	BT1
CO2	**Understand** the importance of community research.	BT2
CO3	**Apply** the findings of community research to understand mental health issues	BT3
CO4	**Examine** the effectiveness of research in community psychology	BT4

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Detailed Syllabus

Modules	Topics / Course content	Hours
I.	Introduction to Community Psychology Definition of community psychology, emergence and association to field of Psychology, core values; Historical and social contexts of community psychology: concept, evolution and nature of community psychology; Role of community psychologist.	12
II.	Research in Community psychology Aims of community research; Models of research in community Psychology; Methods of community research	12
III.	Individuals within communities Person in context; Understanding communities; Sense of community; Human diversity.	15
IV.	Applying community research to individual issues Understanding stress and coping in context: social support, mutual help groups; Preventing Problem behavior; Promoting Social competence.	11
	TOTAL	50

Subject Name: Organizational Behaviour II

Objective: The objective of **Organizational Psychology II (PSY062G401)** is to introduce students to the basic concepts of the field of psychology with an emphasis on applications of psychology in everyday life.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of organizational behaviour	BT1
CO2	**Understand** the importance of group and team work	BT2
CO3	**Apply** the psychological principles in work setting	BT3
CO4	**Analyses** the effectiveness of different types of leadership styles	BT4

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Subject Name: Biopsychology

Objective: The objective of **Biopsychology (PSY062C501/APY062C501)** is to familiarize students with an introductory knowledge of the topics and methods of biological psychology to create an understanding of the underlying biological foundations of human behaviour.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the biological basis of experience and behaviour	BT1
CO2	**Understand** the influence of behaviour, cognition, and the environment on bodily system	BT2
CO3	**Apply** the biological foundations for behaviour regulation	BT3
CO4	**Analyses** the influence of biological foundation in behaviour regulation	BT4

Subject Name: Health Psychology

Objective: The objective of **Health Psychology (PSY062C502)** is to introduce the relationship between psychological factors and physical health and learn how to enhance well-being.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of health psychology	BT1
CO2	**Understand** the models and theories that are used to explain health risk and health-enhancing behaviours	BT2
CO3	**Apply** different types of health enhancing behaviours	BT3
CO4	**Analyze** the chronic illness and its management	BT4

Subject Name: Child Psychology

Objective:

- The objective of **Child Psychology (APY062D502)** is to make the students understand the behavioural concepts pertaining to children.

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Introduce** the concept of family influences, cultural influences and biological influences on child's behaviour.	BT1
CO2	**Understand** the multiple factors that are responsible for reactions to stress and maltreatment in children.	BT2
CO3	**Apply** the knowledge of Childhood Psychological Disorders in understanding children's behaviour.	BT3
CO4	**Analyses** child psychopathology through the knowledge of assessments and intervention.	BT4

Subject Name: Psychology and Media

Objective: The objective of **Psychology and Media (PSY062D501/APY062C501)** is to introduce the effect of media on human psyche and to develop a critical awareness of the underlying psychological processes and mechanisms

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the influence of media on daily life	BT1
CO2	**Discuss** the psychological effects of media	BT2
CO3	**Usage** of media to promote mental health awareness.	BT3
CO4	**Analyze** the effect of media on behaviour.	BT4

Subject Name: Environmental Psychology

Objective: The objective of **Environmental Psychology (PSY062D502/APY062D502)** is to acquaint students with the interrelationships of man and environment and to introduce concepts of sustainable environmental development.

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of human-environment relationship	BT1
CO2	**Understand** the theoretical orientations of environmental psychology	BT2
CO3	**Apply** the knowledge of pro-environmental behaviour in the promotion of sustainable environmental development	BT3
CO4	**Analyses** the strategies and persuasive technology to promote pro environmental behaviour	BT4

Subject Name: Forensic Psychology

Objective: The objective of **Forensic Psychology (PSY062D503/APY062C503)** is to introduce the students to understand the application of psychological principles in the justice and legal system.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of forensic psychology	BT1
CO2	**Identify** the roles and responsibilities of forensic psychologists	BT2
CO3	**Apply** the psychological concepts of assessment and evaluation to legal institutions	BT3
CO4	**Analyze** the ethical issues related to the practice of forensic psychology.	BT4

Subject Name: Cognitive Psychology

Objective: The objective of **Cognitive Psychology (PSY062C601/APY062C601)** is to introduce the practical implications of cognitive processes in human performance

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of cognitive psychology and brain-behaviour relationship	BT1
CO2	**Understand** the anatomy of the brain and its mechanisms responsible for human behaviour	BT2
CO3	**Apply** the knowledge of cognitive psychology in improving memory processes	BT3
CO4	**Analyse** the functions of the brain in language comprehension, language acquisition and thought	BT4

Subject Name: Cultural Psychology

Objective: The objective of **Cultural Psychology (PSY062C602)** is to recognize the cultural influence on human behavior, communication, attitudes, and values

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of culture	BT1
CO2	**Understand** the role of culture in perception and cognition	BT2
CO3	**Apply** the knowledge of cultural psychology	BT3
CO4	**Analyse** the current status of mental health practice and the key issues in the practice of mental health in India	BT4

Subject Name: Organizational Behaviour

Objective: The objective of **Organizational Behaviour (APY062C602)** is to introduce the basic concepts of Organizational Behaviour and its applications in contemporary organizations.

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** concepts of industrial and organizational psychology	BT1
CO2	**Understand** the implications of organizational behaviour on the process of management	BT2
CO3	**Apply** the knowledge of organizational psychology in work place and implementing leadership skills	BT3
CO4	**Analyse** organizational outcome and productivity based on the applications of psychological interventions like motivation and development of human resources	BT4

Subject Name: Sports Psychology

Objective: The objective of **Sports Psychology (PSY062D601/APY062D601)** is to introduce the basic concepts and principles essential to understanding the psychological and behavioral aspects of sport and exercise

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** role of sports psychology and athletic performance	BT1
CO2	**Understand** the integrated theory of motivation that contributes to sports performance	BT2
CO3	**Apply** the knowledge of sports psychology in enhancing individual and team performance	BT3
CO4	**Analyse** the sportsman behaviour and prepare the required sports psychological interventions	BT4

Subject Name: Counselling Psychology

Objective: The objective of **Counselling Psychology (PSY062D602/APY062D602)** is to introduce the theoretical basis of counselling skills, interviewing techniques

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Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** scope and goals of counselling psychology	BT1
CO2	**Understand** the concepts and techniques of various approaches of therapies	BT2
CO3	**Apply** the knowledge of counselling in practice	BT3
CO4	**Analyse** ethics and professional issues in counselling	BT4

Subject Name: Indian Psychology

Objective: The objective of **Indian Psychology (PSY062D603/APY062D603)** is to introduce the students with the core psychological concepts available in the Indian traditions.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Recall** the history of psychology	BT1
CO2	**Understand** the concepts of psychological ideas in the Vedas	BT2
CO3	**Apply** the principles of karma yoga	BT3
CO4	**Analyse** the relationship between Indian concept and wellbeing	BT4

Subject Name: Rehabilitation Psychology

Objective: The objective of **Rehabilitation Psychology (PSY062D604/APY062D604)** is to introduce the importance of rehabilitation, recovery and rehabilitation psychology.

Course Outcomes:

After successful completion of the course, student will be able to		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO1	**Define** the concept of rehabilitation psychology	BT1
CO2	**Identify** the importance of theoretical foundations in psychology for the study of rehabilitation, disability, and health.	BT2
CO3	**Apply** knowledge of models and concepts of disability and chronic illness to education, rehabilitation, and healthcare services	BT3
CO4	**Analyse** different psychological approaches to rehabilitation counselling	BT4

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GUWAHATI

Programme Outcomes and Course Outcome

BA/B.Sc- Travel & Tourism Management

The Assam Royal Global University

Guwahati – 35

Anuradha Deb

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1.1.1 Nature and Extent of Bachelor's Degree Programme in Travel & Tourism Management

A bachelor's degree in Travel & Tourism Management with Research is a 3 years degree course which is divided into 8 semesters as under.

Sl. No.	Year	Mandatory Credits to be secured
1	After successful completion of 1st Year	48
2	After successful completion of 1st and 2nd Years	96
3	After successful completion of 1st, 2nd and 3rd Years	148

A student pursuing 3 years undergraduate programme shall be awarded an appropriate Degree in that discipline on completion of 6th Semester if he/she secures 148 Credits.

Bachelor's Degree is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

Bachelor's Degree programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, the Bachelor Course in Travel & Tourism Management aims to equip students to qualify for joining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

1.2 Programme learning outcomes relating to B.A./B.Sc. degree programme in Travel & Tourism Management

Programme Outcomes

Graduates of the Bachelor of Travel & Tourism Management will be able to:

PO 1 Knowledge of Travel & Tourism

- Contextualize tourism within broader cultural, environmental, political and economic dimensions of society.
- Critique tourism practices for their implications locally and globally.

PO 2 Knowledge of Tourism

- Interpret and evaluate tourism as a phenomenon and as a business system.

- Explain the diverse nature of tourism, including culture and place, global/local perspectives, and experience design and provision.
- Identify and assess relationships and networks relative to building tourism capacity.

PO 3 Professional Skills

- Apply relevant technology for the production and management of tourism experiences.
- Plan, lead, organize and control resources for effective and efficient tourism operations.
- Create, apply, and evaluate marketing strategies for tourism destinations and organizations.
- Develop and evaluate tourism policy and planning initiatives.

PO 4 Ethics and Values

- Demonstrate commitment to ethical practices of tourism.
- Actively engage in the world as global citizens.
- Practice empathy and respect for diversity and multicultural perspectives.
- Apply principles of sustainability to the practice of tourism in the local and global context.

PO 5 Communication

- Select and deploy task-appropriate forms of oral, written, digital, and graphic communication.
- Value and practice active listening, critical thinking, and critical reading.
- Distinguish and produce forms of communication relevant to academia, business, government, and industry.
- Assess, evaluate, and employ appropriate communication tools for discussions within and between teams and members, various audiences, decision-making teams, and corporate communication tasks.

PO 6 Critical Thinking & Problem Solving

- Apply problem solving and critical analysis within diverse contexts.

PO 7 Leadership & Teamwork

- Work collaboratively in groups, both as a leader and a team member, in diverse environments, learning from and contributing to the learning of others.

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Semester – III
Subject Name: Tourism Marketing **Subject Code: TTM202C301**

Course Objective:

The objectives of the course are to introduce the students to basic concepts of marketing and tourism marketing, along with marketing mix.

Learning Outcome:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept of Marketing, its nature and scope for tourism marketing	BT 1
CO 2	To **classify** various segments of market and the issues related to it	BT 2
CO 3	To **identify** the concept of promotion and communication	BT 3

Semester III
Paper II/ Subject Name: Tourism Planning and Policy

Course Objective:

The objectives of the course are to introduce students to concept of Tourism Planning and Tourism Policy

Course Outcomes:
Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept of tourism planning	BT 1
CO 2	To **explain** about the assessment and problems of tourism planning	BT 2
CO 3	To **identify** the tourism policies and tourism committees	BT 3

Semester III
Subject Name: Organizational Behavior

Course Objective:

The objectives of the course are to introduce students to the concept of Organizational Behavior and also understand the importance of organizational dynamics and its social perceptions

Learning Outcome:
Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept of organization	BT 1
CO 2	To **explain** how an organization operates and its dynamics	BT 2
CO 3	To **explain** individuals' perceptions of an organization	BT 2
CO 4	To **identify** organizational structure and line and staff of an organization	BT 3

Semester III
Subject Name: E-Tourism

Course Objective:
Purpose of this course is to acquaint the learner with basics of e-tourism in general and its significance.

Learning Outcome:
Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept and meaning of e-tourism and its significance	BT 1
CO 2	To **explain** the typology of e-tourism of e-tourism and its functioning	BT 2
CO 3	To **explain** the role and function of GDS providers	BT 2
CO 4	To **identify** e-tourism business processes	BT 3
CO 5	To **utilize** the future prospects of e-tourism business	BT 3

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Semester III
Subject Name: Industrial Training

Course Objective: To provide basic and hand on understanding of the industry.

Semester – III (Departmental Compulsory GE)
Subject Name: Tourism Development and History - II

Course Objective: To introduce to the students the significance and role of various modes of transportation in tourism industry

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the tourist transport system and discuss its history and importance	BT 1
CO 2	To **classify** the various modes of transport system available in India and the world and their working system	BT 2
CO 3	To **explain** the tourist transport facilities available in India and the world	BT 2
CO 4	To **identify** the role of technology in tourist transport system	BT 3
CO 5	To **identify** and discuss the various associations and organizations of the tourist transport system	BT 3

Semester IV
Subject Name: Entrepreneurship Management

Course Objective:

The objectives of the course are to introduce students to the basic concepts of Entrepreneurship and Management.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept of entrepreneurship	BT 1
CO 2	To **explain** the concept of management and various level of the same.	BT 2
CO 3	To **identify** the concept of proprietorship	BT 3
CO 4	To **identify** the characteristics of an entrepreneur	BT 3

Semester IV
Subject Name: Human Resource Management

Course Objective:
Human resource is a critical factor for any business activity today. It is therefore important for a manager to understand the concepts of human resource management and refer to same in managing, planning and controlling human resource. The objective of this course is to acquaint the participants with concepts and techniques used in HRM.

Learning Outcome:
Having successfully completed this module, a student will be able to –

CO 1	To **define** tourist transportation and the basics of it	BT 1
CO 2	To **explain** various types of transportation services	BT 2
CO 3	To **identify** various transport systems, their history and their operation procedures	BT 3

Semester – IV
Subject Name: Study Tour, Report and Viva Voce

Course Objective:

The objective of this course is to provide students with a competitive advantage by getting exposure on practical tourism and learn by doing.

Learning Outcome:

Having successfully completed this module, a student will be able to –

CO 1	To **relate** with the tourism eco-system	BT 1
CO 2	To **demonstrate** their knowledge on practical grounds	BT 2
CO 3	To **apply** the concept of tourism through the field visit	BT 3

Semester IV
Subject Name: Tour Operations

Course Objective:

The objectives of the course are to introduce students to operational aspects of Travel Agencies & Tour Operators

Learning Outcome:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the nature, structure and working of Tourism Intermediaries	BT 1
CO 2	To **illustrate** the range of services provided by them and, highlights the intricacies	BT 2
CO 3	To **identify** in tourist services	BT 3
CO 4	To **identify** recent trends and changes in travel agency and tour operations will help them to have updated knowledge	BT 3

Semester IV
Subject Name: Financial Accounting

Course Objective:

The objective of this course is to acquaint students with the various concepts of Financial Accounting and to develop skills for understanding and interpretation of accounting information.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **recall** the concept of Financial Accounting	BT 1
CO 2	To **interpret** the transactions in books of accounts	BT 2
CO 3	To **identify** the dynamics of Joint Stock Company	BT 3

Semester – IV (Departmental Compulsory GE)
Subject Name: Itinerary Designing - II

Course Objective:

The objective of this course is to provide students with a competitive advantage by getting in-depth knowledge on travel destinations and tourist attractions.

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Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **recall** the types of tourists/travelers and their needs	BT 1
CO 2	To **outline** the concepts to develop skills on travel geography	BT 2
CO 3	To **identify** the Geography and the Travel Sales Process	BT 3
CO 4	To **identify** the various geographic features affecting tourism in selected regions both positively and negatively	BT 3
CO 5	To **develop** a file of country fact-sheets using a pre-defined format	BT 3
CO 6	To **develop** a suitable itinerary for various types of tourists/travelers as per their needs	BT 3

Semester – V

Subject Name: Introduction to Statistics
Subject Code: TTM202C501

Course Objective:

The objectives of the course are to impart the knowledge to the students of Statistics and its importance in the tourism industry.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the meaning of statistics and learn about its importance and limitations	BT 1
CO 2	To **classify** statistics and learn tabulation of data	BT 2
CO 3	To **identify** measures of central tendency, dispersion, and skewness	BT 3

Subject Name: Destination Marketing

Course Objective:
The purpose of this course is to impart the knowledge about the Destination Marketing and to become familiar with the techniques and approaches for successful marketing of the destinations of tourist interest.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the characterization, typology of tourism attractions	BT 1
CO 2	To **explain** the various strategy formulation strategies	BT 2
CO 3	To **identify** the various components of destination marketing mix and know the tourism distribution strategy	BT 3

Subject Name: Adventure Tourism

Course Objective:
The purpose of this course is to impart knowledge about the Adventure Tourism and to become familiar with the techniques and approaches for successful marketing of the Adventure Tourism.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the purpose of Adventure Tourism	BT 1
CO 2	To **explain** the minimum standards for adventure tourism	BT 2
CO 3	To **illustrate** the types of adventure activities	BT 2
CO 4	To **identify** the important adventure tourism-based training institutes and organizations	BT 3

Subject Name: Event Management

Course Objective:

The purpose of this course is to acquire an in-depth knowledge about the specialized field of "event management".

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the components of MICE and know the evolution of the same	BT 1
CO 2	To **explain** the nature of conference markets and its demand	BT 2
CO 3	To **identify** the various impacts that MICE put	BT 3

SYLLABUS (5th SEMESTER)
Subject Name: Strategic Management

Course Objective:

The purpose of this course is to acquire an in-depth knowledge about the various managerial skills and their application the real-world scenario.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the basic concept of strategy	BT 1
CO 2	To **explain** the levels of strategy	BT 2
CO 3	To **identify** the various decision-making stages and the process involved in any strategic management	BT 3

Semester – V
Subject Name: Quality Management in Tourism

Course Objective:

After the completion of the course, the students are expected to be familiar and learn about importance and role of quality management in tourism.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the concept of quality management	BT 1
CO 2	To **explain** the application of service quality in managing tourist destinations	BT 2
CO 3	To **identify** various types of services, in future societies and impact of service in daily life	BT 3

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Semester – VI
Subject Name: Managerial Accounting

Course Objective:

The basic objectives are to provide basic principles and to understand the basic technique of preparing financial information.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the basic concepts of management accounting	BT 1
CO 2	To **explain** the marginal costing concept and other concept of costing	BT 2
CO 3	To **identify** various budgetary control concepts along with financial statements and analysis	BT 3

Semester – VI
Subject Name: Map Work and Tourist Map Designing& Aviation Geography

Course Objective:

This course essentially aims to make learners understand the basic concept of mapping and routing with special reference to tourism destinations; also create a base on aviation geography - IATA TC areas, city, country, currency codes, global indicators, airline ticketing and fare calculation.

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the basic concepts of latitude, longitude, and other map related terminologies	BT 1
CO 2	To **explain** the concepts of aviation geography	BT 2
CO 3	To **identify** methods of planning itinerary by air	BT 3

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Semester – VI
Subject Name: Tour Guiding & Interpretation

Course Objective:

The objectives of the course are to explain the basic concepts of Tour guiding and interpretation, its significance in the industry, guiding techniques, situation handling and managing tours such as nature & heritage tours

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the concepts of tour guiding and tour escorting	BT 1
CO 2	To **show** the process of various situation handling	BT 2
CO 3	To **identify** various tourism interpretations and its types	BT 3

Semester – VI
Subject Name: Front Office Management

Course Objective:

To equip the students about the details of front office management as a career opportunity

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the various concepts of hotel industry and its types	BT 1
CO 2	To **explain** the various processes that are involved in reservation and registration process	BT 2
CO 3	To **identify** etiquettes involved in telephone and guest handling	BT 3

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Semester – VI
Subject Name: Cargo Management

Course Objective:

This module is intended to prepare the students to enter in Cargo Handling agencies with well verse knowledge

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the importance of cargo handling	BT 1
CO 2	To **explain** the different proformas required in handling cargo	BT 2
CO 3	To **identify** work dynamics of cargo handling agencies	BT 3

Semester – VI
Subject Name: Globalization, Preservation & Conservation of Culture

Course Objective:

The Paper is designed to familiarize the students with the concept of globalization and integration of developing countries with the world economy and about the importance of diverse regions, languages, religions and traditions

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the meaning of globalization and its benefits	BT 1
CO 2	To **explain** the role of globalization in various sectors of the society	BT 2
CO 3	To **identify** the relation between globalization and world economy	BT 3
CO 4	To **classify** the tangible and intangible cultural heritage	BT 4

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Semester – VI

Subject Name: Basic Legal Requirement for A Start-Up in India

Course Objective:

The Paper is designed to familiarize the students with the process of starting a business in India. This course will also guide the students regarding the uses of various proforma that are needed to startup a business in India

Course Outcomes:

Having successfully completed this module, a student will be able to –

CO 1	To **define** the various types of business	BT 1
CO 2	To **explain** the various documents that are required for a startup in India	BT 2
CO 3	To **identify** the process involved to get Direct Industry Centre Loans	BT 3
CO 4	To **analyze** various formats regarding startups and MSME Subsidized schemes	BT 4

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GUWAHATI

Programme Outcomes and Course Outcome

B.Sc-Zoology

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd. 2018

Anuradha Devi

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1.1.1 Nature and Extent of Bachelor's Degree Programme in Zoology (Honours)

A bachelor's degree in Zoology is a 3 years degree course which is divided into 6 semesters. The credit division is as follows-

Sl. No.	Year	Semester	Credit division
1.	1st Year	1st Semester	24
2.		2nd Semester	24
3.	2nd year	3rd Semester	24
4.		4th Semester	24
5.	3rd Year	5th Semester	26
6.		6th Semester	26
TOTAL CREDITS			148

Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined interms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level. Bachelor's Degree (Honours) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field ofstudy/profession. Thus, BSc (Honours) Course in Zoology aims to equip students to qualify forjoining a profession or to provide development opportunities in particular employment settings.Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

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1.2 Programme learning outcomes relating to B.Sc. (Honours) degree programme in Zoology

Programme Outcomes

PO-1: Knowledge

Demonstrate (i) in-depth knowledge and understanding about the fundamental concepts, principles and processes underlying the academic field of Zoology and its different subfields (animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology and biochemistry, genetics and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, and insect, vectors and diseases, apiculture, aquarium fish keeping, medical diagnostics, and sericulture) (ii) procedural knowledge that creates different types of professionals in the field of Zoology and related fields such as, apiculture, aquarium fish keeping, medical diagnostics, and sericulture, etc.(iii) skills related to specialization areas within Zoology as well as within subfields of Zoology, including broader interdisciplinary subfields (Chemistry, Physics and Mathematics).

PO-2: Comprehension

Use knowledge, understanding and skills required for identifying problems andissues relating to Zoology. Appreciate the complexity of life processes, their molecular, cellular and physiological processes, their genetics, evolution and behaviour and their interrelationships with the environment.

PO-3: Application

Demonstrate subject-related and transferable skills that are relevant to some ofthe job trades and employment opportunities. Accept the legal restrictions & ethical considerations placed for animal welfare. A thorough knowledge of fundamental aspects of animal sciences.

PO-4: Analysis

Ability to understand various social issues and economic problems. To be able to design experiments, analyze data and reach suitable conclusions.

PO-5: Creation

Develop analytical power and logical approach to problem-solving and thereby having a solid understanding of scientific principles underlying animal health, management and welfare.

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Programme Specific Outcomes

PSO1: Ability to apply knowledge of Zoology to realize and explain notions and complexities of animal sciences.

PSO2: Ability to comprehend the relationship of organisms at all levels: molecular, cellular, and organismal

PSO3: Ability to conduct empirical studies for scientific research as well as to validate, analyze and interpret them.

PSO4: Skilled in advanced biological techniques and in-depth understanding of zoological experiments. Understand good laboratory practices and safety.

PSO5: Ability to apply the knowledge of Zoology in various fields such Vermiculture, Sericulture, Wildlife Management, Aquaculture, Livestock Framing and Fisheries. To gain a multi-disciplinary understanding of classical and modern Zoology.

PSO6: Ability to perform as skilled professional in corporate sector, NGO sector, Government line departments, wildlife conservation agencies, academic institutions, pharma and biotech industry, etc.

PSO7: Maintenance of high standards of learning in animal sciences and contributes the knowledge for nation building.

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Semester-I
Paper I/Subject Name: Cell Biology and Molecular Biology

Course Objective: The objective of the course is to help the students to learn and develop a basic understanding of a cell as a basic unit of life. This course is designed to enable them to understand the functions of cellular organelles and how a cell carries out and regulates cellular functions.

Course Outcomes:

Upon completion of the course, students should be able to:
BT1- Understand and describe the fundamental principles of cell biology.
BT2- Explain and compare the structures and functions of various cell organelles involved in diverse cellular processes.
BT3- Describe how cells grow, divide, survive, die and regulate these important processes.
BT4- Have an insight of how defects in functioning of cell organelles and regulation of cellular processes can develop into diseases.

Semester-I
Paper I/Subject Name: Non-Chordates

Course Objective: This course is designed to introduce the students to the diversity of non-Chordates, their systemic classification, phylogeny, characteristics, affinities and significance.

Course Outcomes:
On completion of the course the students will be able to:
BT1- Describe and identify the diverse non-chordate life forms.
BT2- Classify and compare major phyla with respect to their general characteristics.
BT3- Evaluate the relationships between various phyla
BT4- summarise the significance of non- chordates.

Semester-I
Paper I/Subject Name: Cell Biology, Molecular Biology and Non-Chordates

Course Objective: The objective of the course is to help the students to develop a basic understanding of the structural differences of various cell types and the changes that occur during mitosis and meiosis. The students will also be able to identify the invertebrate species based on their morphological and anatomical characteristics and the behavioural patterns exhibited by different invertebrate species.

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Course Outcomes: After completion of the course the students will be able to:

BT1- Identify major classes of bio molecules involved in cellular metabolism.
BT2- Understand the basic structure of different cell types, their morphological differences and characterise the various stages of the cell cycle.
BT3- Describe and differentiate non-chordates based on their morphology, anatomy and special physical features.

AECC-1 (Semester-I)
AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

- Have a knowledge of Communication process, verbal, and non-verbal communication
- Improve the skill of listening processes
- Develop a life skill on oral group communication- group discussion leadership skills, team management.
- Have a basic idea of language styles – oral and written communication.

AECC-2 (Semester I)
AECC-2/Subject Name: Behavioural Science - I

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

- Understand self-identity and identity crisis
- Understand self-esteem.
- Have in depth knowledge of foundation of individual behaviour.
- Develop a life skill on Time management
- Have an idea on barriers of communication.

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SEC-1/Semester I
Paper I/Subject Name: Vermiculture

Course Objective: This course is designed to introduce the students to the basic processes and practice of vermiculture, its scope and economic advantages.

Course Outcomes:

On completion of the course the students will be able to:

BT1- Explain the importance of vermicompost in organic agriculture.

BT2- Recognise the benefits of vermicompost over chemical fertilizers.

BT3- Produce their own vermicompost

BT4- Experience turning their waste into black gold.

GE-1/Semester-I
Paper I/Subject Name: Animal Diversity: Non-Chordates

Course Objective: This course is designed to introduce the students to the diversity of non-Chordates, their systemic classification, phylogeny, characteristics, affinities and significance.

Course Outcomes: On completion of the course the students will be able to:

BT1- Describe and identify the diverse non-chordate life forms.

BT2- Classify and compare major phyla with respect to their general characteristics.

BT3- Evaluate the relationships between various phyla

BT4- Summarise the significance of non- chordates.

GE-2/Semester-I
Paper I/Subject Name: Human health and Diseases

Course Objective: This course is designed to introduce the students to basic concepts health and diseases, how the immune system works against common communicable and non-communicable diseases.

Course Outcomes: On completion of the course the students will be able to:

BT1- Describe the basics of health, diseases and immunity.

BT2- Identify various disease-causing pathogens.

BT3- Summarise the role of immune system.

BT4- Take an informed decision on common communicable and non-communicable diseases

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Semester-II
Paper I/Subject Name: Comparative Anatomy of Animals

Course Objective: This course is designed to acquaint students on comparative anatomy of higher Chordates and provide a detailed account of the mechanisms behind different physiological processes.

Course Outcomes: On completion of the course the students will be able to:

BT1- Describe the basic anatomy of various organ systems in the higher Chordates.
BT2- Compare and summarise the physiology of various organ systems that exist in higher vertebrates.
BT3- Interpret understanding behind the mechanisms and rewrite as per understanding

Semester-II
Paper I/Subject Name: Chordates

Course Objective: This course is designed to introduce the students to the diversity of Chordates, their systemic classification, phylogeny, characteristics, affinities and significance.

Course Outcomes: On completion of the course the students will be able to:
BT1- Describe and identify the diverse Chordate life forms.
BT2- Classify and compare major phyla with respect to their general characteristics.
BT3- Evaluate the relationships between various phyla
BT4- Summarise the significance of Chordates.

Semester-II
Paper I/Subject Name: Practical on Comparative Anatomy of Animals and Chordates

Course Objective: This course is designed to acquaint students on comparative anatomy of vertebrate skeletal structures and the basic anatomy of various organ systems at the tissue level in the higher Chordates.

Course outcomes: After completion of the course the students will be able to:

BT1- Identify the vertebrate species based on their skeletal structures.
BT2- Compare the various organs of higher vertebrates based on histological slides.
BT3- Prepare temporary slides from given samples.
BT4- Formulate and categorize the disarticulated skeletons of animals

AECC-3 (Semester II)	
AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking	

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

- Improve speaking skill.
- Develop a life skill on conversation.
- Improve the skill of public speaking.

AECC-4 (Semester II)
AECC-4/Subject Name: Behavioural Science - II

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

- Understand culture and personality
- Understand Value.
- Demonstrate leadership.
- Develop a life skill on motivation

SEC-2 (Semester II)
Paper I/Subject Name: Sericulture
Course Code: S1 **Subject Code: ZOO142S201**
L-T-P-C – 0-0-2-2
Credit Units: 2
Scheme of Evaluation: Practical

Course Objective: The objective of the course is to introduce the students to the entrepreneurial scope, economic advantages and basic practices involved in sericulture.

Learning Outcomes: Having successfully completed this module A student will be able to learn-

BT1- Students will be able to identify silk producing insects and types of silk
BT2- They will have knowledge of mulberry food plants of silkworm and its cultivation.
BT3- Students will know how to rear and care silkworms independently.
BT4- Learners will understand the entrepreneurial scope of sericulture

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GE-3/Semester-II
Paper I/Subject Name: Animal Diversity- Chordates
Course Code: G1 **Subject Code: ZOO142G201**
L-T-P-C- 2-1-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objective: This course is designed to introduce the students to the diversity of Chordates, their systemic classification, phylogeny, characteristics, affinities and significance.

Course Outcomes: On completion of the course the students will be able to:

BT1- Describe and identify the diverse Chordate life forms.

BT2- Classify and compare major phyla with respect to their general characteristics.

BT3- Evaluate the relationships between various phyla

BT4- Summarise the significance of Chordates.

GE-4/Semester II
Paper I/Subject Name: Animal Parasites

Course Objective: This course is designed to introduce the students to common parasites affecting public health, their life cycles, control measures and the relationships between them and their hosts.

Course Outcomes: On completion of the course the students will be able to:

BT1- Describe, identify and comment on the parasites of clinical importance.

BT2- Compare life cycles of various parasites of clinical importance.

BT3- Evaluate the relationships between various parasites and their hosts.

BT4- Explain role of immune system against parasites

SEMESTER- III
Subject Name: Animal Physiology and Biochemistry

Course Objective: The course is designed to provide a detailed account of the different physiological systems and aims to give a comprehensive insight into the relationships between different physiological setups and a fundamental overview on the endocrine machinery of an animal body.

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Course Outcomes: Upon completion of the course, students should to be able to:

1. Describe and compare structural aspects of various vital organs with regards to animal physiology.
2. Explain and compare the basic life processes such as digestion, respiration, excretion, etc.
3. Illustrate various regulatory mechanisms for control of physiological processes in the animal body
4. Describe basic biomolecules and their roles and distinguish between the various biochemical pathways.
5. Illustrate various regulatory mechanisms for control of biochemical processes

SEMESTER- III
Subject Name: Practical on Animal Physiology and Biochemistry

Course Objective: The course designed to enhance the knowledge of students in physiology, biochemistry and various techniques to assess several important physiological phenomenon.

Course Outcomes: Upon completion of the course, students should to be able to:

1. Quantitatively and qualitatively estimate the amount of carbohydrate, proteins and lipids.
2. Differentiate between the various tissues in the body structurally and morphologically.
3. Assess and interpret the results of various techniques used to analyse physiological health.

DSE / Semester-III
Subject Name: Endocrinology

Course Objective: The course is designed to provide a general account on endocrine system and regulation of hormone action at the molecular level.

Course Outcomes: Upon completion of the course, students should to be able to:

1. Describe and compare various hormones and their roles.
2. Elaborate the mechanism of hormone action.
3. Illustrate the structure of hypothalamus and anterior pituitary.
4. Categorize and compare different endocrine glands and their disorders.

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GE-5/Semester-III
Subject Name: Animal Physiology

Course Objective: The course is designed to provide a general account of the different physiological systems, aims to give a comprehensive insight into the relationships between different physiological setups and a fundamental overview on the endocrine machinery of an animal body.

Course Outcomes: Upon completion of the course, students should to be able to:

1. Describe and compare structural aspects of various vital organs with regards to animal physiology.
2. Explain and compare the basic life processes such as Digestion, Respiration, excretion, etc.
3. Outline the regulatory mechanisms for control of physiological processes in the animal body.

GE-6/Semester-III
Subject Name: Human Biology

Course Objective: The course is designed to provide a general account the structure of cells, life processes, nutrition, diseases and immunity.

Course Outcomes: Upon completion of the course, students should to be able to:

1. Describe and compare various aspects of human biology.
2. Elaborate the immune response and how a good diet helps in maintaining well-functioning immunity.
3. Explore concepts such as lifestyle diseases and various communicable and non-communicable diseases
4. An understanding of cell as basic working units of life. Also, a better insight of DNA and its functions.

Semester IV
Subject Name: Histology & Immunology

Course Objective: The objectives of the course is to introduce students to the basic concepts of immunology, the functioning of the immune system, the components of the immune system along with their structures and function and certain techniques associated with immunology

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Course Outcomes: On completion of the course the students will be able to:

BT1- Describe the types of tissues and organs present in the human body connected to immune system

BT2- Explain the fundamentals of histology, especially on the structures as well the function and locations of different animal tissues and organs as well correct identification of tissues and organs when viewed under microscopes

BT3- Demonstrate an understanding of the components and their functions of immune system.

BT4- Examine and identify knowledge about the mechanisms behind several immunological diseases.

Semester IV
Subject Name: Practical's on Immunology, Histology and Developmental Biology

Course Objective: The paper aims to equip students with the practical skills in the field of immunology and histology and developmental biology.

Course outcome:

BT1- Students will be able to identify the fundamental ideas on immunology, histology and developmental biology.

BT2- Students will be able to explain the processes/techniques involved in the preparation of histological slides the completion of the course.

BT3- Preparation of histological slides and blood film to study various tissues and blood cells

BT4- Draw the various developmental stages of whole mount of chick

Semester IV
Subject Name: Developmental Biology

Course Objectives: The objectives of the course is to introduce students to the basic understanding of the development and structure of gametes, events occurring in early embryonic life, late embryonic life as well as post embryonic development.

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Course Outcomes: On completion of this course students will be expected to

BT1- Outline the sequence and events in development in Aves and Mammals using model organisms

BT2- Discuss the structural and functional aspects of different developmental stages in animals.

BT3- Interpret the different phenomenon and structures regarding developmental biology like teratogenesis, regeneration, parthenogenesis, etc. and mechanisms behind them

BT4- Differentiate the different anomalies related to development of an organism as well as infer relations between these anomalies and diseases caused due to them.

SEC/Semester IV
Subject Name: Introduction to Microscopy and Histology

Course Objectives: The course will introduce the students to microscopy and on the preparation of histological slides.

Learning Outcomes: Having successfully completed this course, learners will be able to-

BT1- Will be able to recognize a light microscope and understand the working of microscopes

BT2- Distinguish and recognize the various cell and tissue structures under the microscope.

BT3- Can relate and employ the basic principles involved in histological methods in the preparation of histological slides

BT4- Students will now be able to prepare and produce histological slides independently.

GE/Semester IV
Subject Name: Ecology

COURSE OBJECTIVE: To educate the students with basic knowledge of ecology and wildlife

COURSE OUTCOMES:

BT1- To describe and impart a clear knowledge about the concept of ecosystem.

BT2- Discuss and recognize the endangered species and the need for their conservation

BT3- Demonstrate and apply the knowledge while interpreting the threats to biodiversity

BT4- Examine the various IUCN rating and analysing the application of IUCN in categorizing species and to critically evaluate work published in both the primary literature and internet

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GEC/Semester IV
Subject Name: Aquaculture

COURSE OBJECTIVE: The learners will have a holistic understanding of the fundamentals and techniques used in aquaculture

COURSE OUTCOME:

BT1- The learner will be able to recall and relate to different fundamentals and concepts relevant to aquaculture

BT2- Describe and review the culturable aquatic species and integrated fish farming

BT3- Employ knowledge of health and safety issues in aquaculture ventures

BT4- Interpret the understanding of aquarium culture and ornamental fishes

SEMESTER-V
Subject Name: Genetics and Genomics

Course Objective:
This course is an introduction of the basic genetics concepts that permeate several other fields in the biological sciences from biochemistry to cell biology.

Course Outcomes: On completion of this course students will be able to:

CO1- Identify and summarize the concept of gene & gene interaction, and sex- linked inheritance.
C03- Interpret the understanding of topics like mutations, eugenics, genetic counselling, euthenics, euphenics and gene regulation, cytoplasmic inheritance in animals.
CO4- Develop the knowledge of how the genome is transcriptionally regulated (genetically and epigenetically) to yield genetic variation at the level of the phenotype.

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SEMESTER-V
Subject Name: Genetics and Genomics (Practical)

Course Objective: The primary course objectives of the paper is to help students develop practical skills on Genetics, Genomics and Ecology

Course Outcomes: On completion of this course students will be expected to:

CO1- List the normal and aberrant metaphase plate of eukaryotes.
CO2- Compare and summarize the different aspects of genotype combination in dihybrid cross
C03- Identify the genetic distance between two loci in a chromosome.

SEMESTER-V
Subject Name: Parasitology

Course Objective: The primary course objectives of the paper is to provide students with knowledge concerning biological, epidemiological, and ecological aspects of parasites causing diseases to humans.

Course Outcomes: On completion of this course students will be expected to:

CO1- Identify the pathogenesis, clinical presentations, and complications of parasitic diseases.

CO2- Compare and summarize the treatment, prevention, and control of parasitic infections.

C03- Interpret the genetic distance between two loci in a chromosome.

SEMESTER-V
Subject Name: Aquatic Biology
Course C ode: D2 **Subject Code:** ZOO142D502
L-T-P-C: 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Theory (As outlined in Point 8)

Course Objective: The primary course objectives of the paper is to provide students with a broad-based foundation in science together with extensive subject knowledge in the discipline of aquatic biology.

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Course Outcomes: On completion of this course students will be expected to:

CO1- Identify the relevant scientific principles in aquatic biology.

CO2- Compare and summarize the unique environmental problems dealing with aquatic environments.

C03- Interpret and evaluate information relevant to aquatic biology.

SEMESTER-V
Subject Name: Evolutionary Biology

Course Objective: The aim of the course is to provide comprehensive overview of concept of evolution and origin of life.

Course Outcome: After successful accomplishment of the course, the students will be able to-

CO1- Describe the essential aspects of Evolutionary Biology in detail which will help them in acquiring better understanding regarding the subject.

C02- Classify the various forces that shapes evolution.

CO3- Explain the process of speciation and macro-evolutionary processes.

SEMESTER-V
Paper/Subject Name: Basic Biostatistics

Course Objectives:

To impart knowledge to students on the basics of biostatistics as an important skill which is required for data collection, data representation and its analysis on a daily basis. The course also aims to familiarise the students with application of computer programs and softwares in biological data analysis for the daily design of experiments as well as hands on practical exercises.

Course Outcomes: After completion of this paper, the students will be able to-

CO1: Define the basic concepts of biostatistics and its various applications in different fields of biological sciences.

CO2: Demonstrate understanding of descriptive statistics & graphical tools and apply hypothesis testing to the available data.

CO3: Application of various computer programs and softwares that are employed to retrieve/ analyze various biological data.

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SEMESTER-VI
Subject Name: Ecology and Wildlife Biology

Course Objective: The primary course objective of the paper is to understand patterns in ecosystem and knowledge across dimensions of ecological organization.

Course Outcome: After successful accomplishment of the course, the students will be able to learn most of the essential aspects of ecology.

CO1: Describe the different aspects of community ecology and dynamics of population.

CO2: Summarize the importance of biodiversity conservation, flagship species in current backdrop of ecological loss and the aspect of human wildlife conflict, wildlife trade and related pandemics.

CO3: Interpret the understanding of how biotic and abiotic factors affect the abundance and distribution of organisms in natural communities.

CO4: Take an informed decision regarding the best environmental practices followed around the world.

SEMESTER-VI
Subject Name: Ecology (Practical)

Course Objective: The primary course objectives of the paper is to help students develop practical skills on ecology.

Course Outcomes: On completion of this course students will be expected to:

CO1- Identify the biotic and abiotic factors and their impact on the abundance and distribution of organisms in natural communities.

CO2- Compare and summarize the different aspects of community ecology and dynamics of population.

C03-. Summarize the various citizen science tools used to study different species.

SEMESTER-VI
Subject Name: Agrochemicals and Pest Management

Course Objective: The primary course objectives of the paper is to understand agrochemicals and their mode of action.

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Course Outcomes: On completion of this course students will be expected to:

CO1- Identify the difference various kinds of agrochemicals.
CO2- Compare and summarize the knowledge of specific modes of pesticide activity
C03-. To summarize and develop awareness of the laws and regulations governing the proper use of pesticides.

SEMESTER-VI
Subject Name: Livestock Management and Animal Husbandry

Course Objectives: The course provides intensive study in livestock production, management, marketing, nutrition, breeding, production records, selection, animal health, waste management, and conservation practices.

Course Outcomes:

CO1- State the breeding systems for a livestock enterprise.
CO2- Associate the importance of genetic improvement in animal production.
CO3- Show and relate current and future issues relating to animal husbandry.

SEMESTER-VI
Subject Name: Aquariculture

Course Objectives: The course envisages information on the industry of Aquariculture and to equip the students with the associated techniques and other important aspects would be addressed.

Course Outcomes:

1. To describe the ornamental fish morphology.
2. Classify and compare the basic accessories of an aquarium.
3. Evaluate the importance of the industry both economically and ecologically.

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SEMESTER-VI
Subject Name: Biotechnology

Course Objectives: The course envisages to acquaint students with basic molecular biological concepts and techniques used in the fields of biotechnology including genetic engineering.

Course Outcomes:

1. Improve the basic concepts in genetic engineering
2. Develop understanding of industrial biotechnology.
3. Evaluate and understand the techniques of proteomics and genomics

SEMESTER-VI
Subject Name: Basics of Bioinformatics

Course Objectives:

To impart knowledge to students on the most important skill which is required to use computer programs for the daily design of experiments, data collection, and analysis of results as well as hands on practical exercises on various computer programming.

Course Outcomes:

CO1: State various computer applications that are employed to retrieve various biological data.

CO2: Describe various biological database namely EMBL, SWISS-PROT, Pub-Med etc. that are useful in the field of bioinformatics.

CO3: Apply knowledge to evaluate various sequence analysis and alignment techniques.

SEMESTER-VI
Subject Name: Entomology

Course Objective: The students will gain knowledge of detailed insect structure, pest of forest and agriculture and their economic importance.

Course Outcome: Post learning this course, students will be able to-

CO1- Observe insect body, shape, wing venation and eye.

CO2- Associate the various components of insect physiology.

CO3- Interpret and analyse the insect control measures.

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SEMESTER-VI
Subject Name: Wildlife Photography and Ecotourism

Course Objective: The idea is to spark an entrepreneurial side in our final year students. To introduce photography and nature tourism as a skill

Course Outcome: Post learning this course, we can expect following outcomes-

CO1- Have a knowledge of basics of photography and settings of camera.

CO2- Compare the various tools and technique of photography.

CO3- To analyse the scope of ecotourism in India.

CO4- Summarise and evaluate the available career options in wildlife photography and ecotourism.

Anuradha Dev

Director, IQAC
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THE ASSAM
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GUWAHATI

Programme Outcomes and Course Outcome

BA-Journalism and Mass Communication

The Assam Royal Global University

Guwahati – 35

1. Program Learning Outcomes for Bachelor of Arts (Hons) in Journalism and Mass Communication:

The outcomes and attributes described in qualification descriptors are attained by students through learning acquired on completion of a program of study. The term 'program' refers to the entire scheme of study followed by learners leading to a qualification.

Program Learning Outcome will include subject specific skills, and generic skills including transferable global skills and competencies.

(a) Demonstrate a coherent understanding of media management, managerial and analytical skills in film making strategies and decisions & higher order skills in chosen area namely journalism, photography, advertising, public relations etc.

(b) Use knowledge, understanding and skills required for identifying problems and issues, collection of relevant quantitative and/or qualitative data drawn form a wide range of sources and application of the information to designing solutions.

(c) Completion of this program will also enable the learners to formulate problems and provide innovative solutions thus; moulding them into future visionaries, media giants that are compassionate yet efficient.

(d) The course provides an extreme and rigorous base for teaching, research, and allied mediums of mass communication.

(e) Develop innovative thinking and entrepreneurial skills.

(f) Demonstrate subject-related and transferable skills that are relevant for entry level media industry positions.

g) Create a sound foundation for students to pursue higher level studies and research in areas of mass communication

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Level: Semester I

Course: C-1

Title of the Paper: Human Communication

Course Objectives:

To define the meaning, concept, process, characteristics and different types of communication involves in human communication that will enable them to understand, appreciate, analyze, and interpret how the communication begins in human existence and the implications of communication theories in mass communication as well as to elaborate the underlying modus-operandi that dominates the media industry.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the meaning, concept and process of communication involves in human communication.	**BT 1**
CO 2	**Explain** the characteristics, types of communication and its implications in human communication that help develops different communication theories.	**BT 2**
CO 3	**Apply** the implications of media theories in mass communication.	**BT 3**
CO 4	**Develop** new interpretations of contemporary mass communication based on the development of human communication.	**BT 3**

Course: C-2

Title of the Paper: Journalism

Course Objectives:

The course introduces to outline growth and development of the Indian press and justify the basics of journalism and reporting, news structure, interview skills and news values. Students will learn to define the process of editing and elaborate the importance of news agencies as well as to specify various elements in writing for print, electronic and digital media.

Adv

Course Outcomes

On successful completion of the course the students will be able to:

Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Relate to the** understanding of the history of press and its role in India's freedom movement.	**BT 1**
CO 2	**Demonstrate the understanding of** sources, reporting, qualities, ethics and values of news in practicing journalism in mainstream media.	**BT 2**
CO 3	**Identify** the art of writing fir media and implication of journalistic ethics in media.	**BT 3**
CO 4	**Develop the** aspects of research in feature writing, non-fiction storytelling techniques, human interest story, news features and able to evaluate media contents independently.	**BT 3**

Course: C-3

Subject: Introduction to Photography

Course Objectives:

To describe the styles, techniques and technologies involve in the process of production in photography and visual media. This course will helps to clarify how photographs can narrate many stories if captured correctly and aesthetically in various genres of photography by justifying the techniques of playing with the light for an aesthetical photograph.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** and **classify** styles, techniques and technologies in the process of production in photography and visual media.	**BT 2**
CO 2	**Identify** how photograph narrates many stories if captured correctly and aesthetically.	**BT 3**
CO 3	**Construct** various genres in photography.	**BT 3**
CO 4	**Analyse** the techniques of playing with the light for an aesthetical photograph.	**BT 4**

Adm

Course: Skill Enhancement Courses – 1 (SEC 1)

Title of the Paper: Photography and Visual Communication

Course Objectives:

To define the basic principles of photography and able to describe the basic methods of visual communication. They will be able to verify the language of photography in visual communication and clarify the concepts and creation of works in photography and visual communication.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Bloom's Taxonomy Level**
CO 1	**Classify** the characteristics and basic principles of photography.	**BT 1**
CO 2	**Identify** the basic methods of visual communication and determine the techniques of camera handling and capturing the images.	**BT 3**
CO 3	**Categorize** the language of photography and visual communication.	**BT 4**
CO 4	**Analyze** mixed media techniques in the virtual and real world of media.	**BT 4**

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Course: Generic Elective - 1 (GE-1)

Title of the Paper: Introduction to Communication & Photography

Course Objectives:

To justify the styles, techniques and technologies used in photography as well as to employ techniques of playing with the light for an aesthetical photograph. The course clarifies how photographs narrate stories aesthetically and identify various genres in photography and also to create independent photography projects

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** professional photography cameras and principles of still images.	**BT 2**
CO 2	**Relate** the knowledge of basic elements of the epic form.	**BT 2**
CO 3	**Apply** stories with the help of photographs.	**BT 3**
CO 4	**Identify** photography projects and portfolio independently.	**BT 3**

Course: Generic Elective - 2 (GE-2)

Title of the Paper: Sound and Radio

Course Objectives:

To define the basics of sound and its uses in radio. They will be taught to describe the various elements of sound design, steps in editing both indoor and outdoor sound recording and its implications in various technologies used for radio production. They will also be introduced to create radio content like, radio news, radio drama and radio jingle.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Compare and contrast** the importance of sound and its elements of sound design	BT 2
CO 2	**Relate** steps in editing indoor and outdoor sound recording.	BT 2
CO 3	**Apply** production in the functioning of radio.	BT 3
CO 4	**Identify** radio contents for any given channel.	BT 3

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Level: Semester II

Course: C-1

Title of the Paper: Communication Design

Course Objectives:

To define the concepts, techniques, principles and practices in Advertising and Public Relations in order to classify the mysteries of media marketing, positioning, market segmentation and targeting in advertising as well as the significance of media in globalization.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the techniques, principles and practices in Advertising and Public Relations.	**BT 2**
CO 2	**Explain** the communication plan for any given product or service in all the mediums of media.	**BT 2**
CO 3	**Apply** public relation campaigns for any given organization or institute.	**BT 3**
CO 4	**Analyze** media contents and mass culture in today's media driven generation.	**BT 4**

Course: C-2

Title of the Paper: Indian Society and Culture

Course Objectives:

The module focuses to describe mass media, culture and society, and its co-relationships in developing critical perspectives in media and the interplay between media content, culture, audiences and society of India, particularly the North Eastern region. It deals to verify various arts forms of Indian and western culture as well as to justify folk media as an effective medium in mass communication and the discourses of media coverage in northeast India.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Outline** the culture and society, and its co-relationships in developing critical perspectives in media and the interplay between media content, culture, audiences and society of India, particularly the North Eastern region.	**BT 2**
CO 2	**Identify** various arts forms of Indian and western culture.	**BT 3**
CO 3	**Apply** the characteristics of folk media as an effective medium in mass communication.	**BT 3**
CO 4	**Analyse** the discourses of media coverage in northeast India.	**BT 4**

Course: C-3

Title of the Paper: Computer Application (Design & Graphics)

Course Objectives:

The course is design to define the meaning, importance and concept of information and communication technology (ICT), and its applications in media. They will get familiarize to adapt with computerizations in practicing journalism and the applications of DTP softwares in print media industry and clarify with various tools in layout and design.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the understanding of Photoshop, InDesign and Microsoft Publisher, and develop their skills in editing and altering photographs.	**BT 2**
CO 2	**Illustrate** newspapers and magazines design.	**BT 2**
CO 3	**Apply** DTP softwares in print media industry.	**BT 3**
CO 4	**Analyze** various formats of layout and design for magazine, book, advertising poster, logo and brochure.	**BT 4**

Course: Skill Enhancement Courses -2 (SEC-2)

Title of the Paper: Short Film Making

Course Objectives:

Students will learn to describe the knowledge of short film and its processes of making short films. They will learn to define the interpretative aspects of short filmmaking and producing professionalshort films and video production.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the skills, knowledge and understanding of short filmmaking.	**BT 2**
CO 2	**Illustrate** visually interpretative aspects of filmmaking and produce short film and video production.	**BT 2**
CO 3	**Apply** various techniques in filmmaking and production.	**BT 3**
CO 4	**Analyze** various sound recording techniques and equipments.	**BT 4**

Course: Generic Elective - 3 (GE-3)

Title of the Paper: Videography

Course Objectives:

The course focuses to draw the similarities and differences between photography and Videography as well as the concept of planning a video film, shooting and produce a video story after editing. Students shall learn to describe how video cameras are handled and how a story can be narrated by compiling video shots, and finally learn to justify the functions of Videography, lighting techniques, indoor and outdoor shooting.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** how a video content could be produced.	**BT 2**
CO 2	**Illustrate** determine the narratives of film and evaluate visual moving images in film and production.	**BT 2**
CO 3	**Apply** various steps in filmmaking.	**BT 3**
CO 4	**Analyze** functions of Videography, lighting techniques, indoor and outdoor shooting.	**BT 4**

Course: Generic Elective - 4 (GE-4)

Title of the Paper: Advertising and Public Relations

Course Objectives:

The course focuses on defining the challenging, competitive and exciting world of advertising and public relations followed with agency structures and advanced advertising practices like positioning, market segmentation and targeting. They will learn to classify the concept of advertising and public relations in marketing, and to create advertisements and public relations for a targeted audience.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Outline** the importance of advertisements and public relations in order to design its campaigns for any product, service and organization.	**BT 2**
CO 2	**Identify** the selection of media for communicating advertisement.	**BT 3**
CO 3	**Apply** characteristics and principles of creating advertising and public relation contents.	**BT 3**
CO 4	**Analyse agency structures and advanced advertising practices like positioning, market segmentation and the press release, events and CSR.**	**BT 4**

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Level: Semester III

Course: C-1

Title of the Paper: Introduction to Film

Course Objectives:

The course shall teach the students to define the fundamental elements of film artistry and production and to describe film styles, history, and production techniques as well as the social values reflected in film art, appreciation, writing for films and regional with special reference to Assam. They will be taught to analyze the elements covered in selected films and its genres in order to make films within their respective thematic and historical contexts.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the importance of films for the society with national and international perspectives.	**BT 1**
CO 2	**Compare** and **contrast** art of filmmaking, appreciation and steps involved in pre to post production.	**BT 2**
CO 3	**Identify** to read and produce film.	**BT 3**
CO 4	**Analyse** film contents, censorship and film festivals.	**BT 4**

Course: C-2

Title of the Paper: Development Journalism

Course Objectives:

The course introduces to define models and research in the development communication in order to classify international agencies and development goals of various organizations. They will learn to apply various aspects of society, major development issues and how communication can help to fill the gaps in the development context of any given society.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** the role of media in the developmental process of a community and different models of development in human developmental process	**BT 2**
CO 2	**Explain** and **interpret** the issues of any given area and design a developmental plan accordingly.	**BT 2**
CO 3	**Identify** the models and support in development communication.	**BT 3**
CO 4	**Examine** the report on development communication for regional and national media.	**BT 4**

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Course: C-2 Discipline Specific Elective - 1 (DSE-1)

Title of the Paper: Message Design for Media

Course Objectives:

The course focuses to identify the development and application of theory in digital media and describe the characteristics of social media tools that enable individuals to create, collaborate, and share messages individually and masses. They will learn to articulate the possibilities and limitations of social media platforms and its implication in mass communication where students learn to design messages for various formats of media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** uses of social media platforms productively and clarify messages for various media units of all the formats of media	BT 2
CO 2	**Apply** journalistic ethics in online journalism practices	BT 3
CO 3	**Develop** the dynamics of social media networks in advertising, public relations and media firms	BT 3
CO 4	**Analyse** the proposal of events and promotion of a company in social media.	BT 4

Course: Generic Elective – 5 (GE-5)

Title of the Paper: Computer Application (Web Designing)

Course Objectives:

The course introduces to clarify the features that distinguish different types of graphics applications and how characterize appropriately during the process of designing. They will learn to define principle of web design, HTML, hyperlinks, images and multimedia as well as to analyze how digital media and freehand drawing skills can be integrated to support design communication and thinking processes.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the basic requirements for designing a web page and web designing language like HTML.	BT 2
CO 2	**Apply** web design principles page for any given service or product.	BT 3
CO 3	**Develop** hyperlinks, images and Multimedia.	BT 3

Course: Generic Elective – 6 (GE-6)

Title of the Paper: Video Production & Editing

Course Objectives:

The course provides to classify the art of video post-production, theory, practice of camera function, script writing and editing styles. They will learn to outline how stories are constructed, demonstrate advanced camera, writing and editing techniques as well as to articulate in-depth examination of Final Cut Pro and Adobe Premier.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the art of video post-production and camera function, script writing and editing styles.	**BT 1**
CO 2	**Explain** how visual stories are constructed.	**BT 2**
CO 3	**Apply** advanced camera, writing and editing techniques.	**BT 3**
CO 4	**Develop** in-depth examination of Final Cut Pro and Adobe Premier.	**BT 3**

Course: Skill Enhancement Courses - 3 (SEC-3)

Title of the Paper: Production (Radio & TV)

Course Objectives:

The course introduces to define the overview of the principles and practices of broadcasting and audio-visual production techniques in order to clarify the writing skills for radio and television journalism and its production. The course deals to describe the history, origin and growth of electronic media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the overview of the principles and practices of broadcasting, and audio-visual production techniques.	**BT 1**
CO 2	**Explain** writing skills for radio and television journalism and its production.	**BT 2**
CO 3	**Apply** the techniques in production, interviewing, voice-over, anchoring and presentation of news.	**BT 3**
CO 4	**Develop** various stages of programme production in both Radio and Television.	**BT 3**

Level: Semester IV

Course: C-1

Title of the Paper: Introduction to New Media

Course Objectives:

The course introduces to define internet and World Wide Web from the perspective of online journalism and classification of multimedia tools like digital audio recorders, video recorders, cameras and GSM phones to tell stories and its effects in society. Student will adapt the characteristics of new media in various avenues of digital and convergence media, where, they learn to prepare the basics of online publishing and writing with the implications of journalistic ethics.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** and **classify** the history and growth of Internet, World Wide Web and various New Media platforms.	**BT 2**
CO 2	**Identify** reporting and publishing offline and online techniques in journalism,.	**BT 3**
CO 3	**Construct** the characteristics of new media and the applications of journalistic ethics in online journalism.	**BT 3**
CO 4	**Analyse** the news reporting and contents of convergent media.	**BT 4**

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Course: C-2

Title of the Paper: Media Management

Course Objectives:

To articulate all the techniques of preparing strategies to manage media units and clarify the media units and how to manage it. They will outline the inflow of capital in media and classify the conglomerates and chain in mainstream Indian media in order to prepare advertising sales and its strategies.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** the techniques and strategies to manage media units and evaluate media units and management.	**BT 2**
CO 2	**Organize** marketing strategies in different media houses and corporate strategies, space and time selling for various media.	**BT 3**
CO 3	**Apply** advertising sales and its strategies.	**BT 3**
CO 4	**Analyze** the patterns of media ownership, conglomerates and chain in mainstream Indian media.	**BT 4**

Course: C-3 Discipline Specific Elective - 2 (DSE-2)

Title of the Paper: Advance Communication

Course Objectives:

The course defines the basic theoretical and conceptual aspects of mass media, society, economy and culture, and its relationship to individuals and how to analyze the theories and models in different forms of communication. It focuses to justify critical humanistic and social scientific theories in communication and clarify psychological and sociological theories in media studies as well as to outline the powerful effects of media in society.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** basic concept of communication theories and its impact on the society, culture and media.	**BT 2**
CO 2	**Organize** critical humanistic and social scientific theories in communication.	**BT 3**
CO 3	**Apply** psychological and sociological theories in media studies.	**BT 3**
CO 4	**Analyze** powerful dynamics of media and its effects in society.	**BT 4**

Course: Skill Enhancement Courses - 4 (SEC-4)

Title of the Paper: Print Production

Course Objectives:

To clarify the growth and development of printing press as well as to equip with the software of designing for both print and digital media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** the functions, growth and development of printing press.	**BT 2**
CO 2	**Relate** the press operations, techniques and digital printing.	**BT 2**
CO 3	**Apply** digital technology and software used in designing and layout.	**BT 3**
CO 4	**Identify** various processes of print and digital production.	**BT 3**

Course: Generic Elective - 7 (GE-7)

Title of the Paper: Film Critics and Appreciation

Course Objectives:

The course introduces to define the true art form and its expressive tool used by writers, directors, and actors and justifies the aesthetics of cinema and its concepts behind the elements of film and storytelling. They will learn to classify what makes a 'good' film and describe the vital roles that directors and critics play in movie making process as well as characterize the role movies play in society.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the different genres of films and techniques of storytelling in various styles and perspectives.	**BT 2**
CO 2	**Explain the various generic classifications of film and factors associated with what makes a 'good' film.**	**BT 2**
CO 3	**Apply the role and effects of movies in society.**	**BT 3**
CO 4	**Analyze film reviews and appreciation.**	**BT 4**

Course: Generic Elective - 8 (GE-8)

Title of the Paper: Broadcast and Online Journalism

Course Objectives:

The course focuses to communicate effectively by using new media tools and categorize the skills of packaging and distribution of information in both targeted and general audiences by using multiple platforms. They will be taught to justify the implications of online and broadcast tools in journalism and clarify the applications of MoJo in journalism practices as well as differentiate the implications of media laws and ethics in broadcast and online journalism.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the effects of new media tools and its advantages and disadvantages.	**BT 2**
CO 2	**Explain** the functioning concepts of blogging, micro blogging and other social media handles.	**BT 2**
CO 3	**Apply** the art of writing in online journalism and broadcast media.	**BT 3**
CO 4	**Analyze** the implications of media ethics in broadcast and online journalism.	**BT 4**

Level: Semester V

Course: C- 1

Title of the Paper: Media Laws and Ethics

Course Objectives:

The course introduces to define the principles of media laws and ethics and clarify the current and evolving state of media laws such as ideals as freedom of expression and the press. They will learn to justify the elements in press laws under the Indian Constitution and categorize between media laws and ethics and its implications in mainstream media in order to identify the issues in practicing journalism in mainstream Indian media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast media laws and ethics in media.**	**BT 2**
CO 2	**Relate the current and evolving state of media laws such as ideals as freedom of expression and the press.**	**BT 2**
CO 3	**Apply elements in press laws under the Indian Constitution and its implications in mainstream media.**	**BT 3**
CO 4	**Identify issues in practicing journalism in mainstream Indian media.**	**BT 3**

Course: C- 2

Title of the Paper: Advertising & Public Relations

Course Objectives:

The course deals to identify the functions, elements and concepts of advertising and public relations in modern day marketing scenario. Students will learn to justify how advertisements and public relations are targeting a segment of the public and advertising agency structures and practices like positioning, market segmentation and targeting in order to create advertisements for any given product and service and also to design an effective public relations campaign.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the importance of advertisements and public relations and its campaign for any product/service and organization.	**BT 2**
CO 2	**Explain** media for communicating an advertisement by analyzing the reach of the media and selection of market segment.	**BT 2**
CO 3	**Apply** public relation campaigns depending on the requirement of any organization targeting the internal or external public	**BT 3**
CO 4	**Analyze** advertisements for any given product and service as well as public relations campaign.	**BT 4**

Course: C- 3

Title of the Paper: Project and Portfolio

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Bloom's Taxonomy Level**
CO 1	**Classify** portfolio containing all the works which was done by them in last six semesters	**BT 1**
CO 2	**Identify** the specific discipline in journalism and mass communication.	**BT 3**
CO 3	**Categorize** various departments and its functions in media.	**BT 4**
CO 4	**Analyze** the professional abilities of practicing journalism in mass communication and related fields.	**BT 4**

Course: C- 4 (DSE-3)

Title of the Paper: Film Critics & Appreciation

Course Objectives:

The course highlights the principles of Radio and Television production and clarifies the history and origin of Radio and Television and its various programme productions. They will be taught to justify the process of planning, drafting and writing scripts before production and how to create scripts for audio and visual media as well as to apply the techniques of digital media in production.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** to the principles of Radio and Television production.	**BT 1**
CO 2	**Demonstrate the understanding of** the history and origin of Radio and Television and its various programme productions.	**BT 2**
CO 3	**Identify** the process of planning, drafting and writing scripts before production.	**BT 3**
CO 4	**Develop** scripts for audio and visual media as well as the tools and techniques of digital media in production.	**BT 3**

Level: Semester V

Course: C- 6

Title of the Paper: Internship

Mandatory 6 weeks internship after 4th Semester Exam

Course Objectives

The course focuses to clarify the major departments in a media house and adapt with news gatherings and editing professionally. It also deals to interface their specialized discipline in media and industry experience in order to adapt as a professional communicator in mass media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO 1	**Classify** different role and responsibilities of a media practitioner in media.	**BT 1**
CO 2	**Identify** news gatherings and significance of editing professionally.	**BT 3**
CO 3	**Categorize** major departments and its functions in media.	**BT 4**
CO 4	**Analyze** contents and formats in mass media professionally.	**BT 4**

Examination Scheme: Marks: Practical: 100

Feedback from Media Organization	Internship Report	Power Point Presentation	Vice Voce	Grand Total
30	30	20	20	100

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Level: Semester VI

Course: C- 1

Title of the Paper: International Communication

Course Objectives:

The course introduces to describe the concept of international communication and clarify the role of new technologies and its impact on international flow of information. It will justify the functions of major international media houses and agencies, and outline the alternative Information Distribution System as well as to imply the regulations of international standards in media laws and ethics.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the concept of international communication and the role of new technologies and its impact on international flow of information.	**BT 1**
CO 2	**Compare** and **contrast** the functions of major international media houses and agencies.	**BT 2**
CO 3	**Identify** the alternative Information Distribution System in International communication.	**BT 3**
CO 4	**Analyse** the regulations of international standards in media laws and ethics.	**BT 4**

Course: C- 2

Title of the Paper: Community Communication

Course Objectives:

The course highlights the growth and development of development communication and clarifies the processes and functions of communication at the community development. It justifies the effects of development communication for social change and categories case studies in national, regional and local region as well as defining citizen participation as one of the vital means in providing information, education and to empower the community.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** community in any given society and issues to develop the community.	**BT 2**
CO 2	**Relate** case studies in national, regional and local region for getting broad idea of community media and its function.	**BT 2**

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CO 3	**Apply** participation as one of the vital means in providing information, education and to empower the community.	BT 3
CO 4	**Identify** the effective media and community media message.	BT 3

Course: C- 3

Title of the Paper: Media Research

Course Objectives:

This course outlines to develop media research culture among academics and professionals in different fields and clarifies research in their specific areas of interest. It will help to justify various types of research designs and its procedures to conduct research to meet the national and international requirements with various methodological, theoretical and statistical implications in media research as well as to define the methods of data analysis and report writing.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Outline** the different types of research and scientific steps media research.	BT 2
CO 2	**Identify** various methodological, theoretical and statistical implications in media research.	BT 3
CO 3	**Apply** critical thinking and independently and conduct scholarly research.	BT 3
CO 4	**Analyse** the methods of data analysis and report writing.	BT 4

Course: C- 4 (DSE-5)

Title of the Paper: Media in North East

Course Objectives:

The course deals to describe the historical background of media and its evolution in North Eastern Region of India and clarify the trends in reporting and analysis of modern journalistic during conflict situations as well as to classify traditional media and the understanding of socio-economic, political and cultural Development of North Eastern Region in India.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate the historical background of media and its evolution in North Eastern Region of India.**	**BT 2**
CO 2	**Apply the trends in reporting and analysis of modern journalistic practices during conflict situations.**	**BT 3**
CO 3	**Develop the effects of traditional media in socio-economic, political and cultural development of North East, India.**	**BT 3**
CO 4	**Analyse the problem and challenges faced by the journalists working in Northeast India.**	**BT 4**

Course: C- 5 (DSE-6)

Title of the Paper: Corporate Communication

Course Objectives: To introduce the concepts of corporate communication. To explore image and reputation building management. To know case studies and crises management.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** community relations, customer, vendor and dealer relations.	**BT 2**
CO 2	**Apply** various communication tools for crisis management.	**BT 3**
CO 3	**Develop** the understanding of the legal and ethical issues in the Corporate Communication.	**BT 3**
CO 4	**Analyse** the problem and challenges faced by corporate communicators.	**BT 4**

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Course: C- 6 (DSE-7)

Paper: News and Contemporary Issues

Course Objectives: Will help the students keep abreast with the current news which will trigger them to compose news items. To develop their interest in knowing what's happening in the national and global scenario.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the students how to be updated and relevant in the society by getting exposed to the right kind of news and current affairs sources.	**BT 2**
CO 2	**Apply** the national, international and regional political scape in depth.	**BT 3**
CO 3	**Develop** the students for competitive exams which will help them cracking exams like UPSC, Staff Selection and so on.	**BT 3**
CO 4	**Analyse** the importance of all kinds of news.	**BT 4**

Course: Skill Enhancement Courses - 5 (SEC-5)

Title of the Paper: Photojournalism

Course Objectives:

The course focuses to describe the fundamentals, composition and technical aspects of photography in photojournalism and categorize various tools and techniques in photo editing. It clarifies various themes in creating photo features, essays and practices of professional photojournalism in media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the ethical responsibilities of a photojournalist and able to evaluate events and incidents from the perspective of a photojournalist.	**BT 2**
CO 2	**Apply** various tools and techniques in photo editing.	**BT 3**
CO 3	**Develop** photo stories after editing for the right medium.	**BT 3**
CO 4	**Analyse** various themes in creating photo features and essays.	**BT 4**

Level: Semester VII

Paper: Research Methodology 1

Course Objectives:

The course focuses to describe the fundamentals, composition and technical aspects of research in mass communication and categorize various tools and techniques in the same. It clarifies various themes in creating new ideas, research papers and practices of professional research in media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the importance of research and scientific investigation of issues	**BT 2**
CO 2	**Apply** various tools and techniques of research in solving social problems	**BT 3**
CO 3	**Develop** the idea of research	**BT 3**
CO 4	**Encourage** to undertake independent research and presents their findings in a systematic manner	**BT 4**

DSE-8

Paper: New Media

Course Objectives:

The course focuses to describe the fundamentals, composition and technical aspects of new media and categorize various tools and techniques in the same. It clarifies various themes in creating new ideas.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the importance of New Media	**BT 2**
CO 2	**Apply** various tools and techniques of New Media	**BT 3**
CO 3	**Develop** the new ideas on new media.	**BT 3**
CO 4	**Analyse** various themes in creating new ideas through new media.	**BT 4**

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Core Papers (C)
Minor Research Project: (Project and Portfolio)

Subject Code: JMC092C721

Level: Semester VIII

Paper: Research Methodology II **Subject Code:** JMC092C801

Course Objectives:

The course focuses to describe the fundamentals, composition and technical aspects of research in mass communication and categorize various tools and techniques in the same. It clarifies various themes in creating new ideas, research papers and practices of professional research in media.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the importance of research and scientific investigation of issues	**BT 2**
CO 2	**Apply** various tools and techniques of research in solving social problems	**BT 3**
CO 3	**Develop** the idea of research	**BT 3**
CO 4	**Encourage** to undertake independent research and presents their findings in a systematic manner	**BT 4**

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Major Research Project
Paper: Dissertation

Course Objectives

The objective of the course is to make students apply the theoretical aspects acquired in the previous semesters. It will test the students' ability to independently carry out a research work to solve a certain problem.

Course Outcomes

Students will be in the position to **Identify** and **Develop (BT3)** an area of research, conduct an independent **Survey (BT4)** and subsequently **Determine (BT5)** the outcome of the research through **Interpreting (BT5)** to draw **Solution (BT6)** to a problem.

Anuradha Das

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The Assam Royal Global University

THE ASSAM
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GUWAHATI

Programme Outcomes and Course Outcome

BA / B.Sc -Geography

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd. 2018

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1.1 Nature and Extent of Bachelor's Degree Programme in Geography (Honours)

A bachelor's degree in Geography with Research is a 3 years degree course which is divided into 6 semesters as under.

Sl. No.	Year	Mandatory Credits to be secured for the Award
1	After successful completion of 1st Year	48
2	After successful completion of 1st and 2nd Years	96
3	After successful completion of 1st, 2nd, and 3rd Years	148

The curriculum inculcates knowledge of essential concepts of physical and human geography together with appropriate techniques using lectures, tutorials, group discussions, presentations, assignment evaluation, lab work and field visits. Thus, the pedagogy process includes:

i. Identifying and explaining the physical and cultural characteristics globally and processes in varied spatiotemporal contexts.
ii. Understanding human-environment and nature-society interactions as well as various global environmental challenges.
iii. Analysing geographic information by using geospatial technologies.
iv. Responding to the global and national challenges and initiatives.

1.2 The Programme Learning Outcomes relating to B.A./B.Sc. (Honours) degree programme in Geography

The learning outcome is to prepare the students of BA/BSc Honours degree in Geography, to understand the development of the subject and delve around issues suited to the needs of the contemporary world. It covers a wide range of papers covering various themes and maintains uniformity of structure across universities in the country. Geography being interdisciplinary in nature integrates learning derived from all basic and applied sciences/social sciences.

PO-1: **Knowledge of Geography**: Students of the BA/BSc Honours degree in Geography will learn to use geographic understanding of various sub fields such as physiography, resources, global economic systems, socio- cultural aspects, rural and urban milieu, environmental and disaster studies, and mapping methods.

PO-2: **Understanding of global issues**: They will also develop an understanding of global issues from economic, social, environmental, and political perspectives, which has relevance in further studies across the globe.

PO-3: **Interpretation and generation of map**: They will be trained to read and interpret maps and generate maps and other geographic representations as well as extract, analyze, and present information from a spatial perspective.

PO-4: **Analyse both geographical qualitative and quantitative data:** The learners will have a general understanding of the various theoretical and methodological approaches in both physical and human geography and be able to develop research questions and critically analyze both qualitative and quantitative data to answer those questions.

PO-5: **Critical analysis with diverse perspective:** After the completion of the course, students will be able to evaluate, analyze, synthesize, and critique key concepts and experiences, and apply diverse perspectives to find creative solutions to problems concerning society and the natural world.

PO-6: **Developing skills of team work**: They will also be able to learn how to take teamwork experiences in the classroom and field excursions and use them to their advantage to further their career.

PO-7: **Skills of research and Hypothesis testing**: Students will acquire knowledge of scientific methods of data handling, hypothesis generation, testing and analysis.

PO-8: **New and independent learning techniques**: Students will be able to assess and build upon previous learning and experiences to pursue new learning, independently and in collaboration with others.

PO-9: **Preparing the students to face the real world challenges**: The course will better-equip students to face the challenges of an increasingly intercultural world, and contribute to improving tolerance within the diverse societies of India and World.

PO-10:**Developing ethical aptitudes**: Students will develop the ethical aptitudes and dispositions necessary to acquire and hold leadership positions in industry, government, and professional organizations.

PO-11:**Developing interest on exploration and personality development**: They will also developzeal of exploration and investigation, travel exploration and effective communication skills and teamwork.

PO-12:**Life-long learning**: The geography graduates will be able to pursue wide range of knowledge and experience from various fields. They will be well informed citizens who can play immense role in the civil society too and also be able to pursue career as planners, administrators, academicians, and managers.

Programme Specific Outcomes

PSO-1: Correlate the knowledge of physical geography with the human geography. They will analyze the problems of physical as well as cultural environments of both rural and urban areas.

PSO-2: Develop a sustainable approach towards the ecosystem and the biosphere with a view to conserve natural environment and analyze how physical environment, human societies and global economic systems are integrated to the principles of sustainable development.

PSO-3: Explain the cultural geographic processes, the global distribution of cultural mosaics, and comprehend how variations in culture and personal experiences may affect our perception and management of places and regions.

PSO-4: Identify socio-economic problems of their community through field experience envisaged in the curriculum by applying statistical and cartographic techniques, GIS and remote sensing process.

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B.A/B. Sc. (Honours) Course in Geography: Semester-I

Paper I Core Course	GEOGRAPHY OF HUMAN AND CULTURAL LANDSCAPE

Course Objectives: *The objective of this course is to make the student look into the chronology of development of human geography through contribution of varied scholars, approaches and schools of human geography, major themes and components of cultural geography.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various parameters and components of the sub-branch.	BT1
CO2	**Interpret** the development of a humanistic view of geography.	BT2
CO3	**Identify** the various aspects of human geography.	BT3
CO4	**Discover** the humanistic perspective and its dimensions in Geography in relation to the physical and cultural surrounding.	BT4

Paper II Core Course	CARTOGRAPHIC TECHNIQUES

Course Objectives: *This course focuses on the basics of map and map scale and its varied types along with the diagrammatic representation of geographical data.*

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Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** about map and its types, map scale, transect chart and profile mapping.	BT1
CO2	**Interpret** topographic and weather maps.	BT2
CO3	**Construct** graphs/charts, cartograms and thematic maps based on socio-economic, cultural and climatic data.	BT3
CO4	**Analyze** the importance of maps for regional development and decision making.	BT4

Paper III Core Course	**GEOMORPHOLOGY**

Course Objectives: *The pivotal point of this course is to make students familiar with the fundamental concepts of geomorphology which incorporates the topics related to geomorphic structure and processes, earth's interior and composition, evolution of landforms and so on.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the functioning of Earth systems in real time.	BT1
CO2	**Outline** the roles of structure, stage and time in shaping the landforms along with **interpreting** geomorphological maps.	BT2
CO3	**Apply** the knowledge in geographical research.	BT3
CO4	**Distinguish** between the mechanisms that control these processes and also **analyse** how the natural and anthropogenic operating factors affect the development of landforms.	BT4

Paper SEC Course	INTRODUCTION TO MAP MAKING

Course Objectives: *This course primarily focuses on the basic concepts of art and science of map making in geographical study.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** knowledge regarding the classification and elements of maps.	BT1
CO2	**Interpret** graphs and prepare qualitative and quantitative thematic maps.	BT2
CO3	**Apply** the maps for the proper utilization in the process of development.	BT3
CO4	**Examine** the preparation of various thematic maps with the application of various techniques.	BT4

B.A./B. Sc. (Generic Elective) Course in Geography: Semester-I

Paper: GE I Generic Elective	SOCIAL AND POLITICAL GEOGRAPHY

Course Objectives: *The course aims to make students understand the basic concepts related to social and cultural geography in the geographical framework and provide knowledge on the political system and geopolitics of the world in the spatial context.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the fundamental concepts of social and political dimensions.	BT1
CO2	**Interpret** the social, cultural, and political concepts in a broader and analytical manner	BT2
CO3	**Build** knowledge on structures, formations of countries as well as on various schools of political geography	BT3
CO4	**Analyze** the socio-cultural and political theme in the geographical dimensions	BT4

Paper: GE II Generic Elective	**PHYSICAL GEOGRAPHY**

Course Objectives: *The course aims to make students aware about physical surroundings (landforms, climate, ecosystems and oceanic landforms) their processes and patterns on the earth's surface and acquire knowledge on Ecological balance, Global climatic changes and consequences.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the basic terms and terminologies related to physical earth.	BT1
CO2	**Compare** different global climatic patterns, climate change and its related consequences.	BT2
CO3	**Identify** physical processes and the resultant environment and its impact which shapes our life on planet earth.	BT3
CO4	**Examine** ecological, climatic and atmospheric phenomena of the earth.	BT4

B.A/B. Sc. (Honours) Course in Geography: Semester-II

Paper III Core Course	**CLIMATOLOGY AND OCEANOGRAPHY**

Course Objectives: *The course aims to illustrate the atmospheric elements, processes and resultant weather and climates, the impact of climates on planet earth, the oceanic processes, ocean floor topography and marine resources.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the elements of weather and climate and its impacts at different scales.	BT1
CO2	**Demonstrate** weather charts, hythergraph and other similar practical exercises.	BT2
CO3	**Develop** the climatic aspects and its bearing on planet earth and the oceanic process and availability of resources.	BT3
CO4	**Distinguish** between the different aspects of climatic and oceanic terms.	BT4

Paper II Core Course	**FUNDAMENTALS OF GEOINFORMATICS**

Course Objectives: *The course aims to make student interpret the data, tools and technology and applications of Geoinformatics - GIS, Remote Sensing and GPS and Construct and Analyse maps using Geospatial Technology (Geoinformatics)*

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Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the fundamental terms and terminologies of Geoinformatics.	BT1
CO2	**Outline** the strength and application of Geospatial Technology.	BT2
CO3	**Build** map of the resources, their location and availability.	BT3
CO4	**Analyse** the different remote sensing data sets collected from various platforms.	BT4

Paper I Core Course	**GEOGRAPHY OF TOURISM**

Course Objectives: *The course aims to make the students define the basic theme and concepts of tourism geography and interpret the geographical components of tourism.*

Learning Outcome:

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the geographical aspects that organise economic space.	BT1
CO2	**Illustrate** the geographical aspects of tourism in an area.	BT2
CO3	**Develop** practical field knowledge about tourist places across India.	BT3
CO4	**Analyse** the knowledge gathered through field visits and prepare their respective reports.	BT4

Paper SEC Course	REMOTE SENSING

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of remote sensing.	BT1
CO2	**Interpret** principles and applications of various remote sensing techniques including aerial photography.	BT2
CO3	**Utilize** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.	BT3
CO4	**Apply** this knowledge for land use land cover map preparation.	BT4

B. A. / B. Sc. (Generic Elective) Course in Geography: Semester-II

Paper GE-2 Core Course	REGIONAL DEVELOPMENT OF NORTHEAST INDIA

Course Objectives: *The course aims to define the regional basis of Northeast India and Assam and evaluate the basic ideas of the position of Northeast India and Assam in the Indian context.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining North-East India as a regional unit.	BT1
CO2	**Compare** and interpret the disparity that prevails among the different states of northeast.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of northeast India and Assam.	BT4

Paper GE-2 Core Course	**INTRODUCTION TO GEOSPATIAL TECHNOLOGY**

Course Objectives: *The course aims to explain the technological revolution in mapping and analysing resources and infrastructure using Geospatial Technologies and develop theoretical knowledge and skill in Remote Sensing, GIS and GPS.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the basic concepts and historical development of geographical information technology.	BT1
CO2	**Interpret** data structure, functions and working of geographical information technology.	BT2
CO3	**Apply** the geographical information technology for the sustainable development of the nation.	BT3
CO4	**Analyse** and understand the basics of EMR and energy interaction in atmosphere and on earth surface features.	BT4

B.A/B. Sc. (Honours) Course in Geography: Semester-III

Paper I Core Course	ECONOMIC GEOGRAPHY

Course Objectives: *It focuses on the basic concepts of economic geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** concepts and ways on how geographical aspects organise economic space.	BT1
CO2	**Compare** different sectors of economy and arrive at logical conclusion regarding importance of each sector in economic development of the nation.	BT2
CO3	**Identify** the principles and significance of economic geography.	BT3
CO4	**Discover** new insights among students on the relevance of economy and geography and associated problems in contemporary times.	BT4

Paper II Core Course	QUANTITATIVE METHODS IN GEOGRAPHY

Course Objectives: *This paper provides an understanding of the pure and applied nature of Geography along with the key elements in the discipline.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the statistical methods and quantitative techniques used in Geography.	BT1
CO2	**Interpret** various methods and techniques of data collection, data tabulation, data interpretation and analysis.	BT2
CO3	**Identify** the importance of data in geography.	BT3
CO4	**Analyse** data through tabulation, sample size and other methods by handling data in the field.	BT4

Paper III Core Course	**PROJECT WORK**

Course Objectives: *This paper provides an understanding the basics of research project preparation.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** real world issues for carrying out research on a specific field	BT1
CO2	**Infer** ideas of research through literature review.	BT2
CO3	**Develop** hypothesis and research questions.	BT3
CO4	**Identify** appropriate sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a detail project report	BT6

Paper DSE - 1	PRINCIPLES OF AGRICULTURAL GEOGRAPHY

Course Objectives: *The course tries to make the students understand the basic concepts of agricultural geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** concepts of agricultural geography.	BT1
CO2	**Compare** different sectors of economy and arrive at logical conclusion regarding importance of agriculture sector in economic development of the nation.	BT2
CO3	**Identify** the principles and significance of agricultural geography.	BT3
CO4	**Discover** new insights on the relevance of agricultural geography and associated problems in contemporary times.	BT4

Paper, DSE - 1	AGRICULTURAL PRACTICES IN INDIA

Course Objectives: *The course aims to make the students understand the role and place of agriculture in Indian Economy.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the definition, basic concepts and field of Agricultural Geography.	BT1
CO2	**Apply** the various indices associated with agriculture.	BT2
CO3	**Develop** the basic ideas related to geographical perspective of agriculture in India.	BT3
CO4	**Analyse** the fundamental processes associated with agricultural system of India.	BT4
CO5	**Appraise** the significance of agriculture in Indian economy.	BT5

Paper: GE I Generic Elective	POPULATION STUDIES

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the basic definitions and concepts related to population geography.	BT1
CO2	**Outline** the population parameters of India.	BT2
CO3	**Apply** and analyse the resultant impact of contemporary issues related to population on society and environment.	BT3
CO4	**Analyse** contemporary issues related to population dynamics and environment.	BT4

Paper: GE II Generic Elective	BIOGEOGRAPHY

Course Objectives: *The course aims to make students understand the fundamental concept of biogeography under various categories.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** and understand the basic terms and concepts of biogeography.	BT1
CO2	**Interpret** the important issues pertaining to environment.	BT2
CO3	**Construct** the basic concepts of biogeography.	BT3
CO4	**Analyse** independently the various biodiversity conservation and management issues.	BT4

B.A/B. Sc. (Honours) Course in Geography: Semester-IV

Paper I Core Course	SOCIAL AND POLITICAL GEOGRAPHY

Course Objectives: *The objective of the course is to introduce students to the principles and significance of social and political geography.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Find** the definition, basic concepts and field of the subject.	BT1
CO2	**Explain** the social, cultural and political concept in a broader and analytical manner.	BT2
CO3	**Develop** new insights among students on the relevance of social and political aspects of geography and associated problems in contemporary times.	BT3
CO4	**Analyse** the socio-cultural and political theme in the geographical dimensions.	BT4

Paper II Core Course	ENVIRONMENTAL GEOGRAPHY

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

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Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of science of environmental change and sustainable development.	BT1
CO2	**Classify** different types of natural resources and its importance.	BT2
CO3	**Develop** understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation from hazards and management of solid wastes.	BT4
CO5	**Explain** the policies of development and environmental protection in developed and developing countries.	BT5

DSE II	**FIELD WORK IN GEOGRAPHICAL RESEARCH**

Course Objectives: *It aims to give the idea of the importance of various surveying techniques in geographical study, and understand the field ethics and different tools of field study.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**How** to scientifically design a research and write a field report.	BT1
CO2	**Interpret** the various dimensions of field work and its role in geographical studies.	BT2
CO3	**Identify** the principles and techniques of surveying.	BT3
CO4	**Analyze** with the help of different surveying techniques for representation of various spatial objects/Phenomena.	BT4

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DSE II	RESEARCH METHODOLOGY IN GEOGRAPHY

Course Objectives: *The course aims to make the students understand the basics of qualitative and quantitative research, literature review, data collection, identification of research problem, formulate research objectives and research questions, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts and tools of research.	BT1
CO2	**Infer** ideas that can be taken up for research work through literature review.	BT2
CO3	**Develop** hypothesis and research questions.	BT3
CO4	**Identify** appropriate data collection and sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a scientific research report	BT6

Paper SEC Course	Report Writing on Environmental Issues

Course Objectives: *This course intends to make the students understand the various dimensions of field work and its role in geographical studies, along with introducing to basic report writing and field tools.*

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Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Choose** new geographical landscape as study area.	BT1
CO2	**Infer** in-depth knowledge of different field techniques.	BT2
CO3	**Choose** the field ethics and different tools of field study.	BT3
CO4	**Analyze** different field techniques in detail.	BT4

B.A./B. Sc. (Generic Elective) Course in Geography: Semester-IV

Paper: GE I Generic Elective	**CLIMATE CHANGE VULNERABILITY AND ADAPTATION**

Course Objectives: *The course aims to give the idea of the concept of climate change and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of Science of Climate Change.	BT1
CO2	**Classify** different types of vulnerability.	BT2
CO3	**Develop** understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation.	BT4

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Paper: GE II Generic Elective	RURAL DEVELOPMENT

Course Objectives: *The course aims to make students aware of the concepts, approaches and planning process related to rural development in India, along with understanding the rural economic base, rural development process and provision of services in rural areas.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the need and approaches to rural development.	BT1
CO2	**Interpret** in detail about the rural economic base especially about the significance of development of non-farm sector in rural areas.	BT2
CO3	**Develop** in-depth knowledge of pre and post-independence period of rural development.	BT3
CO4	**Analyze** the relevance of access to services like health, education in rural areas.	BT4

B.A/B. Sc. (Honours) Course in Geography: Semester-5

Paper I Core Course	REGIONAL PLANNING AND DEVELOPMENT

Course Objectives: *This course intends to make the students* understand the concept of a region from a Geographic perspective and its ramifications in planning.

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Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of regional planning	BT1
CO2	**Explain** the strategic importance and applicability of planning in multi-level aspects	BT2
CO3	**Build** plans for development in rural and urban regions	BT3
CO4	**Apply** this knowledge in real world situations.	BT4
CO5	**Interpret** various issues related to regional planning on national and global perspective	BT5

Paper III Core Course	**POPULATION AND SETTLEMENT GEOGRAPHY**

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Tell** about the basic definitions and concepts related to population geography and human settlements.	BT1
CO2	**Outline** the population parameters of India.	BT2
CO3	**Apply** and analyse the resultant impact of contemporary issues related to population on society and environment.	BT3
CO4	**Analyse** contemporary issues related to population dynamics and environment.	BT4
CO5	**Determine** clear exposition of spatial and structural characteristics of human settlements	BT5

Paper II Core Course	**Internship**

Course Objectives: *This paper provides an understanding the basics of research project preparation.*

Course Outcomes:

After the completion of course, the students will have ability to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** real world issues for carrying out research on a specific field	BT1
CO2	**Infer** ideas of research through literature review.	BT2
CO3	**Develop** hypotheses and research questions.	BT3
CO4	**Identify** appropriate sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation.**	BT5
CO6	**Design and develop** a detailed project report	BT6

DSE PAPER -1	**GEOGRAPHY OF RURAL DEVELOPMENT**

Course Objectives: *The course aims to make students aware of the concepts, approaches and planning process related to rural development in India, along with understanding the rural economic base, rural development process and provision of services in rural areas.*

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Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the need and approaches to rural development.	BT1
CO2	**Interpret** in detail about the rural economic base especially about the significance of development of non-farm sector in rural areas.	BT2
CO3	**Develop** in-depth knowledge of pre and post-independence period of rural development.	BT3
CO4	**Analyze** the relevance of access to services like health, education in rural areas	BT4
CO5	**Interpret** the various types of data along with **critical evaluation.**	BT5
CO6	**Design and develop** a detail project report	BT6

DSE PAPER - III	**REMOTE SENSING: PRINCIPLES AND APPLICATIONS**

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of remote sensing.	BT1
CO2	**Explain** principles and applications of various remote sensing techniques including aerial photography.	BT2
CO3	**Utilize** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.	BT3
CO4	**Apply** this knowledge for land use land cover map preparation.	BT4
CO5	**Interpret** Geospatial data	BT5

DSE PAPER - II	GEOGRAPHY OF HEALTH

Course Objectives: *The course aims to develop understanding about the concepts of health, factors determining human health, its diffusion under various environments and overall health related issues that comes up.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the different disease classifications and the approaches to study about health.	BT1
CO2	**Outline** the concept of human health and healthcare from the perspective of geography.	BT2
CO3	**Develop** knowledge about factors influencing human health and occurrence of diseases in varying ecological settings.	BT3
CO4	**Analyse** the impact of environmental degradation on human health and occurrence of various diseases in different ecological settings.	BT4

Paper DSE - 5	DISASTER MANAGEMENT

Course Objectives: *The objective of this course is to make the student understand about the hazards, disasters, its associated causes and impacts, its distribution and mitigation with special reference to India.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1.	**Define** the concepts of hazard and disaster and its related terminologies.	**BT 1**
CO2.	**Demonstrate** the distribution and mapping of disasters that is prevalent in India.	**BT 2**
CO3.	**Explain** the mitigation process and response to disasters across Indian territory.	**BT 2**
CO4.	**Distinguish** between causes and effect of varied disasters, as well as their implications in present day India.	**BT 4**

SEMESTER 6

Paper I Core Course	GEOGRAPHY OF INDIA

Course Objectives: *The course aims to define the regional basis of India and evaluate the basic ideas of the different aspects of India.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining India as a regional unit.	BT1
CO2	**Compare** and **interpret** the disparity that prevails among the different states of India.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of India.	BT4
CO5	**Examine** the position of India in global context.	BT5

Paper II Core Course	PRACTICAL WORKS IN GEOGRAPHY

Course Objectives: *The course aims at increasing the practical knowledge of the students.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the principles and concepts involved in Practical Geography.	BT1
CO2	**Classify** the nature, characteristics and sources of map projection.	BT2
CO3	**Develop** the skills and technical capabilities of the students.	BT3
CO4	**Simplify** the application of the concepts related to Geomorphology, Climatology and Population Geography.	BT4

Paper I Core Course	GEOGRAPHICAL THOUGHT

Course objective: *The objective of this course is to make the student look into the chronology of development of the subject of geography through contribution of varied scholars, approaches and schools, major themes and components of geography.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various parameters and components of Geography.	BT1
CO2	**Interpret** the chronological development of the subject of geography.	BT2
CO3	**Identify** the contributions made by the schools of geography.	BT3
CO4	**Discover** the physical and humanistic perspective and its dimensions in Geography in relation to the physical and cultural surrounding	BT4
CO5	**Explain** the various issues of real world with a geographical perspective	BT5

DSE Course	SOIL AND BIOGEOGRAPHY

Course Objectives: *The course aims to make students understand the fundamental concept of soil and biogeography under various categories.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** and understand the basic terms and concepts of soil and biogeography.	BT1
CO2	**Interpret** the important issues pertaining to environment.	BT2
CO3	**Construct** the basic properties, morphology and other properties associated with soil and biogeography.	BT3
CO4	**Analyse** independently the various biodiversity conservation and management issues.	BT4

Paper, DSE - 1	REGIONAL DEVELOPMENT OF NORTHEAST INDIA AND ASSAM

Course Objectives: *The course aims to define the regional basis of Northeast India and Assam and evaluate the basic ideas of the position of Northeast India and Assam in the Indian context.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining North-East India as a regional unit.	BT1
CO2	**Compare** and interpret the disparity that prevails among the different states of northeast.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of northeast India and Assam.	BT4
CO5	**Examine** the basic idea of position of Northeast India and Assam in Indian context.	BT5

DSE PAPER	Environment and Sustainable Development

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

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Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of science of environmental change and sustainable development.	BT1
CO2	**Classify** different types of natural resources and its importance.	BT2
CO3	**Develop** understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation from hazards and management of solid wastes.	BT4
CO5	**Explain** the policies of development and environmental protection in developed and developing countries.	BT5

Paper DSE-5	**GLOBAL CLIMATE CHANGE**

Course Objectives: *The course aims to give the idea of the concept of climate change and its impact on various aspects in global context, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1.	**Relate** to basics of Science of Climate Change.	**BT 1**
CO2.	**Classify** different types of vulnerability.	**BT 2**
CO3.	**Develop** understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health.	**BT 3**
CO4.	**Inspect** upon the issues of adaptation and mitigation.	**BT 4**
CO5.	**Recommend** suitable measure for mitigation of issues related to climate change.	**BT 5**

Paper DSE-6	Urban Geography

Course Objectives: *The course aims to give the idea of the concept of urban geography and its major aspects as well as it seeks to develop new insights among the students on the relevance of urban geography and its associated problems in a rapidly urbanizing world.*

Course outcomes:

After successful completion of the course, the students will be able to:		
SI No.	**Course Outcome**	**BT Level**
CO1.	**Define** concepts related to urban geography and its approaches.	**BT 1**
CO2.	**Explain** different geographical factors which organise urban spaces and develop ideas in its relation.	**BT 2**
CO3.	**Identify** the new insights on the relevance of urban geography.	**BT 3**
CO4.	**Discover** and develop skills seeking advanced studies on urban planning and development.	**BT 4**

Paper SEC Course	Mapping in GIS

Course Objectives: *This course intends to make the students understand the practical applications of geoinformatics*

Course Outcomes:

After the completion of the course, the students will have the ability to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Build** map of the resources, their location and availability.	BT1
CO2	**Analyse** the different data sets collected from various platforms through GIS.	BT2
CO3	**Interpret** Geospatial data in GIS platforms and perform analysis from various sources of data such as Remote Sensing and GPS for geographical research	BT3

Anuradha Dey

THE ASSAM
ROYAL GLOBAL UNIVERSITY
GUWAHATI

Programme Outcomes and Course Outcome

Bachelor of Computer Applications

The Assam Royal Global University
Guwahati – 35

Anuradha Dev.

The Assam Royal Global University IQAC Estd : 2016

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1.1 Nature and extent of the BCA programme

The most important aspect of computer science is problem solving. It spans the design, development and analysis of software and hardware used to solve problems in a variety of business, scientific and social contexts. It covers the core computer science topics like computer systems architecture, data structures, computer networks, operating systems, computer graphics and multimedia, algorithms, software engineering, database management, theory of computation, Java programming and web technology. The course also facilitates the inclusion of inter- disciplinary subjects as one can choose from a list of Generic Electives (GE) as per their field of interest; like for example one can opt for economics, physics, chemistry, photography or videography, art, media or any other subjects offered by different departments and schools of the Assam Royal Global University. Skill enhancement courses enable students to acquire the skill relevant to employability. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Ability enhancement courses like Communication English, Behavioral Science and Functional Assamese honing their personalities and etiquettes and preparing them to be better communicators for better employability. The well- structured LOCF programme for BCA is designed to empower the students with skills and knowledge leading to enhanced career opportunities in various sectors of human activities.

The bachelor's degree in BCA is a 3 years degree course which is divided into 6 semesters as follows:

YEAR	SEMESTER	CREDITS
I	I	24
	II	24
II	III	24
	IV	24
III	V	26
	VI	26
	Total	**148**

A student pursuing 3 years BCA programme shall be awarded a bachelor degree in Computer Application on completion of 6th Semester after securing 148 Credits.

Programme Learning Outcomes for BCA

Programme Outcomes (POs)

- **PO1-Computational Knowledge:** Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.
- **PO2- Communication Efficacy:** Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
- **PO3- Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
- **PO4- Design / Development of Solutions:** Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
- **PO5- Conduct Investigations of Complex Computing Problems:** Ability to devise and conduct experiments, interpret data and provide well informed conclusions.
- **PO6- Modern Tool Usage:** Ability to select modern computing tools, skills and techniques necessary for innovative software solutions

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- **PO7- Professional Ethics:** Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
- **PO8- Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
- **PO9- Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.
- **PO10- Individual & Team Work:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.
- **PO11- Innovation and Entrepreneurship:** Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
- **PO12- Life-long Learning:** Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

Programme Specific Outcomes (PSOs)

- **PSO1- Knowledge of Computing Systems:** An ability to understand the principles and working of computer systems.
- **PSO2- Project Development Skills:** An ability to understand the structure and development methodologies of software systems.
- **PSO3: Software Development Skills:** Familiarity and practical competence with a broad range of programming language and open-source platforms.
- **PSO4: Mathematical Skills:** An ability to apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm

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SYLLABUS (1st SEMESTER)

Paper I/Subject Name: Fundamentals of Computer Science

Course Objective:

The objectives of the course are to explain the basic components of a computer system and to discuss about issues related to data processing with computers and various computer software and programming.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate and understand** both the hardware and software components of computer systems and networking.	BT 1 & 2
CO 2	**Identify** the different types of software and use them accordingly.	BT 3
CO 3	**Analyse** the utility of programming languages	BT 4

Paper II/Subject Name: Introduction to C Programming

Objective:

The objectives of the course are to give the students exposure to computer programming and make them capable of using the concepts to solve basic as well as advanced computing problems.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **demonstrate** the working of C programming language.	BT 1 & 2
CO 2	**Apply** the programming concepts to solve various problems.	BT 3
CO 3	**Analyse** and debug the errors while writing the programs.	BT 4
CO 4	**Assess** and design a new algorithm to solve a new real life problems	BT 5

Introduction to C Programming Lab

Objective:

The objectives of the course are to make the student learn about problem solving techniques through C programming language and to enhance the analyzing and problem-solving skills.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate and understand** the execution of programs written in C language.	BT 1 & 2
CO 2	**Apply** the programming concepts to solve various problems.	BT 3
CO 3	**Analyse** and debug the errors while writing the programs.	BT 4
CO 4	**Assess** and design a new algorithm to solve a new real life problems	BT 5

Paper III/Subject Name: Digital Logic and Computer Design

Objective:

The objectives of the course are to provide an understanding to the students about the Simplification of Boolean expression, combinational and sequential circuits and their implementation through various logic gates.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **understand** the concepts of combinational and sequential circuit design	BT 1 & 2
CO 2	**Apply** the concepts learnt to design digital circuits.	BT 3
CO 3	**Analyse** the outputs produced and behaviour of the different circuits.	BT 4

Subject Name: Digital Logic and Computer Design Lab

Objective:

The objectives of the course are to make the students implement the given Boolean function using logic gates using both in POS and SOP form

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the implementation of logic gates on the bread board.	BT 2
CO 2	**Build** combinatorial and sequential circuits based on the concepts gained.	BT 3

Paper IV/Subject Name: Web Development with Java Script

Objective:

The objectives of the course are to enable the students to build a robust foundation for computational thinking and make them learn client-side web development.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic characteristics and concepts of web development.	BT 2
CO 2	**Build** static web pages and manipulate data using javaScript and work with the HTML Canvas	BT 3
CO 3	**Analyse** and **evaluate** websites in terms of its design and basic processing at the client side.	BT 4 & 5

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Paper V/Subject Name: Multimedia Tools and Applications

Objective:

The objectives of the course are to make the students understand the concept of multimedia entails, Interactive Multimedia, Hypermedia and Multimedia Authoring processes and techniques.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic of multimedia concepts	BT 2
CO 2	**Utilise** tools for developing Multimedia projects.	BT 3
CO 3	**Apply** the Multimedia compression technologies to image, audio, animation and video.	BT 3
CO 4	**Compare** and contrast IT tools for authoring 2D and 3D Drawings.	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AEEC-I/II)

Paper VI/Subject Name: Developing Oral Communication and Listening Skills

Objective:

The objectives of the course are to develop and enhance the students' oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basics of written and oral communication.	BT 2
CO 2	**Apply** the concepts learnt in day-to-day life.	BT 3

Paper VII/Subject Name: Concepts of Behavioural Science

Objective:

The objectives of the course are to make the students understand the various elements of behavioral science, the way it is conducted and applied in different researches.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the various elements of behavioural science.	BT 2
CO 2	**Apply** the concepts learnt in their real life.	BT 3

Detailed Syllabus of Skill Enhancement Course (SEC-I)

Paper VIII/Subject Name: Image Editing and Animation

Objective:

The objectives of the course are to introduce the students with the concepts and practical skills of Graphics and Animation Development and open-source tools which are freely available for downloading.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the basic idea behind image enhancement, modelling and animation	BT 2
CO 2	**Experiment** with image enhancement with the concepts learnt.	BT 3
CO3	**Analyse** and **assess** any given image for its quality along with the 2D/3D modelling of various architectures.	BT 4 & 5

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Detailed Syllabus of Value Addition Course (VAC-I)

Paper IX/Subject Name: Office Automation

Objective:

The objectives of the course are to make the students work with the basic tools under MS office Suite.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the working of the applications under the MS Office Suite.	BT 2
CO 2	**Build** sheets, presentations, word documents and will be able to work with databases.	BT 3

SYLLABUS (2nd SEMESTER)

Paper III/Subject Name: Computer Organisation and Architecture

Objective:

The objectives of the course are to make the students understand the machine instruction, basic computer organization and memory hierarchy with pipelining processing.

Prerequisites: Basics of Digital Logic and Computer Design

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** computer architecture concepts related to design of modern processors, memories and I/O	BT 2
CO 2	**Experiment** with and **analyse** the performance of commercially available computers	BT 3 & 4

Paper II/ Subject Name: Object Oriented Programming using C++

Objective:

The objectives of the course are to teach the basic concept and techniques which form the object-oriented programming paradigm.

Prerequisites: Basics of Programming

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of OOP.	BT 2
CO 2	**Build** C++ programs and find errors in it.	BT 3
CO 3	**Analyse** a problem and construct a C++ program that solves it.	BT 4
CO 4	**Criticise** a C++ program and describe ways to improve it.	BT 5

Object Oriented Programming using C++ Lab

Objective:

The objectives of the course are to make the student learn C++ programming language to solve various real life problems.

Prerequisites: Basics of Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **interpret** the basic concepts of OOP.	BT 1 & 2
CO 2	**Solve** problems by writing C++ programs.	BT 3
CO 3	**Analyse** and **evaluate** programs for its efficiency.	BT 4 & 5

Paper III/Subject Name: Data Structures and Algorithms

Objective:

The objectives of the course are to expose the students with the concepts of algorithm design and various types of data structures.

Prerequisites: Basics of C Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic constructs of data structure, implementation and application.	BT 2
CO 2	**Utilise** the appropriate data structures to solve a given problem.	BT 3
CO 3	**Analyze** and **evaluate** the pseudocodes for their complexity analysis.	BT 4 & 5

Subject Name: Introduction to Data Structures Lab

Objective:

The objectives of the course are to make the students develop skills to design and analyze programs with simple linear and non-linear data structures and analyze their complexities.

Prerequisites: Basics of C Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the application of elementary data structures such as stacks, queues, linked lists, trees and graphs	BT 2
CO 2	**Utilize** appropriate data structures to solve various problems.	BT 3
CO 3	**Analyze** and **evaluate** algorithms for its efficiency.	BT 4 & 5

Detailed Syllabus of Generic Elective (GE-III/IV)

Paper IV/Subject Name: Server Side Programming

Objective:

The objectives of the course are to teach students the process to build web applications using the Ruby on Rails framework.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the process of building web applications using Rails database	**BT 1 & 2**
CO 2	**Build** dynamic web applications.	**BT 3**
CO 3	**Compare** and **criticise** the design of web applications.	**BT 4 & 5**

Paper V/Subject Name: Introduction to Cyber Space

Objective:

The objectives of the course are to make the students understand the concept of Cyber Security and its related issues and challenges as well as to make them aware of the e-commerce applications.

Prerequisites: Basics of Computer Network, Web technology

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the different forms of Cyber Security threats and vulnerabilities.	**BT 2**
CO 2	**Experiment** with the adverse effect of social media on people.	**BT 3**
CO 3	**Analyse** and **evaluate** the digital payment system security and remedial measures against digital payment frauds.	**BT 4 & 5**

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Conversation and Public Speaking

Objective:

The objectives of the course are to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Prerequisites: Basic understanding of conversation and speaking in public.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various skills of speaking at different levels.	BT 2
CO 2	**Apply** the skills learnt in their day-to-day life.	BT 3

Paper VII/Subject Name: Understanding Self and Others

Objective:

The objectives of the course are to provide the students insight into the various aspects of self and how one perceives and comprehends other's behaviour in the light of their present appearance

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and visualise one's own self.	BT 2
CO 2	**Develop** one's own behaviour.	BT 3
CO3	**Analyse** other's behaviour in the light of their present appearance.	BT 4

Detailed Syllabus of Skill Enhancement Courses (SEC-II)

Paper VIII/Subject Name: Windows Programming using C#

Objective:

The objectives of the course are to enable the students to learn concepts on C# and .NET framework

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** introductory programming concepts using C#	BT 2
CO 2	**Apply** logical alternatives with C# decision structures utilizing iteration, class methods, fields, and properties.	BT 3
CO3	**Simplify** forms, classes, and controls into C# solutions utilizing arrays and file/database access methods	BT 4

Detailed Syllabus of Value Addition Course (VAC-II)

Paper IX/Subject Name: Computer Hardware and Networking

Objective:

The objectives of the course are to explain the different hardware components of a computer system and learn its assembling and disassembling along with various networking devices.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic idea of installation process and components of a PC	BT 2
CO 2	**Experiment** with some hardware components to assemble a computer system.	BT 3
CO3	**Analyse** and **evaluate** different networks to decide for setting up small networks	BT 4 & 5

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: JAVA Programming

Objective:

The objectives of the course are to teach the concepts and implementations of object-oriented programming using JAVA language.

Prerequisites: Basics of Procedural or Object-Oriented Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic idea of installation process and components of a PC	BT 2
CO 2	**Apply** the concepts of Java, multithreading and Exception handling to develop efficient and error free codes.	BT 3
CO3	**Analyse** and **evaluate** programs for reusability.	BT 4 & 5

JAVA Programming Lab

Objective:

The objectives of this course are to make the students understand and analyze practically the utility of JAVA programming language.

Prerequisites: Basics of Procedural or Object-Oriented Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** he concepts of Java programming.	BT 2
CO 2	**Utilize** an integrated development environment to write, compile, run, and test simple object-oriented Java programs.	BT 3
CO3	**Analyse** and **evaluate** problems for better solutions	BT 4 & 5

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Paper II/Subject Name: Introduction to Database Management

Objective:

The objectives of the course are to make the students learn about databases and the process of designing and constructing data models.

Prerequisites: C/C++, Concepts of Data Structures.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and applications of database systems	BT 2
CO 2	**Apply** the basic concepts of MySql and write queries using it.	BT 3
CO3	**Analyse** the designed database for normalisation.	BT 4
CO 4	**Evaluate** the process of transaction processing and concurrency control	BT 5

Introduction to Database Management Systems Lab

Objective:

The objectives of the course to teach the student database design and query processing through MySql.

Prerequisites: C/C++, Concepts of Data Structures

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** a database schema for a given problem-domain.	BT 2
CO 2	**Build** queries in MySql with the concepts learnt.	BT 3
CO3	**Analyse and evaluate** the queries for its correctness.	BT 4 & 5

Detailed Syllabus of Department Specific Elective (DSE-I)

Paper III/Subject Name: Graph Theory

Objective:

The objectives of the course are to explain the fundamental concepts in graph theory such that it can be used to solve practical problems.

Prerequisites: Concepts of Data Structures and Discrete Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** mathematical definitions of objects in graph theory.	**BT 2**
CO 2	**Apply** mathematical concepts to solve graph-related problems.	**BT 3**
CO3	**Utilize** a combination of theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph theory.	**BT 3**
CO 4	Analyse and critically assess a mathematical proof.	**BT 4**

Paper III/Subject Name: Discrete Mathematics

Objective:

The objectives of the course are to make the students learn fundamental concepts of mathematical relations, functions, number theory and graph theory and their use in the field of IT.

Prerequisites: Basic Mathematical Foundations

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the concept of logic, sets, relations and functions to solve problems.	**BT 2**
CO 2	**Apply** the concepts learnt to solve computer science related problems.	**BT 3**
CO3	**Analyse** and evaluate the solutions.	**BT 4**

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Detailed Syllabus of Generic Elective (GE-V/VI)

Paper IV/Subject Name: Front-End Development with React

Objective:

The objectives of the course are to teach the students about React & Type Script to enable them to create web pages.

Prerequisites: Fundamentals of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** static types and know how to port untyped JavaScript	BT 2
CO 2	**Apply** the concepts learnt to create Single Page Web Applications (SPA) using React, Typescript and Tailwind CSS.	BT 3
CO 3	**Inspect** different elements of front-end development	BT 4

Paper V/Subject Name: IPR and Cyber Laws

Objective:

The objectives of the course are to enlighten the students with various legal, social and international issues and the various remedies available under the Information Technology Act for the breach and commission of offence in cyber space.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concept and idea behind IPR and cyber laws	BT 2
CO 2	**Identify** the various legal, social and international issues and the various remedies available under the Information Technology Act for the breach and commission of offence in cyber space	BT 3
CO 3	**Analyse** the risks around Cyber Security when trading and doing business online.	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Career Oriented Communication		Subject Code: CEN9B2A301
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Objective:

The objectives of the course are to prepare students to adopt different communication strategies and meet the competitive market of employment by considering relevant information related to job requirements.

Prerequisites: Basic understanding of the need to groom oneself for employment and the need for preparation of the same.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the requirement of the job market.	BT 2
CO 2	**Build** oneself for the competitive market of employment with the concepts learnt.	BT 3

SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Operating Systems

Objective:

The objectives of the course are to teach the basic concepts and functions of operating systems and make them understand the principles of concurrency.

Prerequisites: Concepts of Computer Organization and Architecture

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basic concepts of Operating systems.	BT 2
CO 2	**Apply** the principles of scheduling, and concurrency to solve various problems.	BT 3
CO 3	**Analyze** and **evaluate** the execution of simultaneous processes for deadlock.	BT 4 & 5

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Operating Systems Lab

Objective:

The objectives of the course are to make the students learn about process and disc scheduling practically along with the working of system calls.

Prerequisites: Fundamentals of Computer Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and implement basic services and functionalities of the operating system using system calls.	BT 2
CO 2	**Utilize** modern operating system calls and synchronization libraries in software/ hardware interfaces.	BT 3
CO 3	**Analyze** various Scheduling algorithms to better usage of the CPU.	BT 4

Paper II/Subject Name: Data Communication and Networks

Objective:

The objectives of the course are to make the students understand the significance and concepts of computer networks along with the layered architecture.

Prerequisites: Basics of internet technologies and graph theory

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the significance and concepts of computer networks	BT 2
CO 2	**Identify** the layered model for computer networking	BT 3
CO 3	**Analyse** and **evaluate** basic protocols and design issues for layered model.	BT 4 & 5

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Data Communication and Networks Lab

Objective:

The objectives of the course are to make the students learn socket programming and to make them familiar with simulation tools.

Prerequisites: Fundamentals of Computer Programming and Data Communication

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the various working of various protocols and understand the utility of socket programming	BT 2
CO 2	**Utilize** simulation tools for network programming	BT 3
CO 3	**Analyze** the performance of the routing algorithms and protocols in different layers.	BT 4

Detailed Syllabus of Department Specific Elective (DSE-II)

Paper III/Subject Name: Computer Graphics and Multimedia		Subject Code: CAP052D401
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are to provide a comprehensive knowledge on the concepts of computer graphics.

Prerequisites: Concepts of Computer Programming and Basic Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** pictures & interact with pictures for presentations	BT 2
CO 2	**Apply** the concepts learnt to implement various shape drawing algorithms, 2D/3D transformations, homogeneous coordinates and	BT 3
CO 3	**Examine** the applications of multimedia and the various multimedia elements.	BT 4
CO 4	**Analyse** the various image, audio, video formats and different compression and decompression standards.	BT 5

Paper III/Subject Name: Information Theory and Coding

Objective:

The objectives of the course are to teach different coding techniques for information and also give an insight on entropy.

Prerequisites: Concepts of Basic Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** different Information coding schemes	BT 2
CO 2	**Apply** error control coding techniques while receiving information	BT 3
CO 3	**Apply** number theory concepts in encryption and decryption techniques	BT 3
CO 4	**Analyze** the basic encryption and decryption standards.	BT 4

Detailed Syllabus of Generic Elective (GE-VII/VIII)

Paper IV/Subject Name: Web Integration and Application		Subject Code: INT052G402
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Objective:

The objectives of the course are to teach the students the use of pull requests, maintain workflow, and enable them to find appropriate JS language for projects.

Prerequisites: Basics of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the process of integrating websites to applications.	BT 2
CO 2	**Utilize** pull requests to perform development work.	BT 3
CO 3	**Choose** between popular JS flavours and pick one that is suitable for a task.	BT 3

Paper V/Subject Name: Introduction to Game Design and Development

Objective:

The objectives of the course are to enable the students to identify and apply principles of design and modelling along with making them aware of the various issues associate with it.

Prerequisites: Basics of Web Development and Server Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the fundamental skills and concepts in game design and development.	BT 2
CO 2	**Apply** the concepts learnt to design a new game.	BT 3
CO 3	**Analyze** the designed games for improvement.	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-III/IV)

Paper VI/Subject Name: Communication and Presentation Skills

Objective:

The objectives of the course are to prepare students to develop report writing skills, deliver effective presentation and be informed about technology-enabled communication in the 21st century.

Prerequisites: Basic writing skills in English.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the skills required for giving presentations.	BT 2
CO 2	**Build** reports, make presentations and have basic understanding of technology-enabled communication in the 21st century.	BT 3

Detailed Syllabus of Skill Enhancement Courses (SEC-III)

Paper VIII/Subject Name: System Administration

Objective:

The objectives of the course are to make the students familiar with python and to explain the process of connecting a Unix/Linux server to the network and share resources on the network.

Prerequisites: Basics of Operating Systems

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and analyse the basic system administration tools.	BT 2
CO 2	**Apply** the concepts learnt to administer Unix/Linux machines as standalone workstations or in a network environment.	BT 3
CO 3	**Identify** different commands of Linux system	BT 4

Detailed Syllabus of Value Addition Course (VAC-III)

Paper IX/Subject Name: Disaster Management

Objective:

The objectives of the course are to impart a critical understanding for disaster, risks, etc and their reduction and humanitarian response

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define and interpret** disasters and hazards and the various types of associated risks.	BT 1 & 2
CO 2	**Examine** the economic repercussions of disasters.	BT 3
CO3	**Analyse** and **assess** risks.	BT 4 & 5

SYLLABUS (5th SEMESTER)

Paper I/Subject Name: Web Technology

Objective:

The objectives of the course are to provide knowledge on the basic web concepts, scripting languages and Internet protocols

Prerequisites: Basics of computer programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concept of web development	BT 2
CO 2	**Apply** the concepts learnt to develop simple web applications	BT 3
CO 3	**Assess** and **evaluate** two web applications based on various design factors.	BT 4 & 5

Web Technology Lab

Objective:

The objectives of the course are to teach the students practically about Internet and Web Page Design by using Markup Languages and XML and also to introduce them to the concept of Server-Side technologies.

Prerequisites: Computer Programming Fundamentals

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the concepts of front end and backend programming for web development.	BT 2
CO 2	**Apply** the concepts on designing web pages.	BT 3
CO 3	**Analyze** and **test** web applications in different web servers	BT 4 & 5

Paper II/Subject Name: Python Programming

Objective:

The objectives of the course are to teach the students techniques to build and develop python codes.

Prerequisites: Fundamentals of Computer Programming

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and terminologies of Python Programming	BT 2
CO 2	**Apply** the concepts learnt to write efficient programs	BT 3
CO 3	**Analyze** and **evaluate** the codes to fix the errors	BT 4 & 5

Python Programming Lab

Objective:

The objectives of the course are to enable students to write compile and run pythons scripts to solve problems.

Prerequisites: Fundamental Concepts of any Programming Language

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the basic concepts of Python Programming and **Demonstrate** proficiency in the handling of loops and creation of functions.	BT 1 & BT2
CO 2	**Implement** different data structures using Python	BT 2
CO 3	**Apply** the commonly used operations involving file handling.	BT 3
CO 4	**Develop** logic of various programming problems using numerous data types and control structures of Python.	BT 3

Detailed Syllabus of Department Specific Elective (DSE-III/IV)

Paper III/Subject Name: Introduction to Data Mining

Objective:

The objectives of the course are to introduce basic data mining concepts and techniques so that the students can discover various patterns from given data

Prerequisites: Concepts of Database Management Systems.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and process of mining data	**BT 2**
CO 2	**Apply** the statistical methods to preprocess data.	**BT 3**
CO 3	**Examine** the data to be mined and present a general classification of tasks	**BT 4**
CO 4	**Evaluate** the supervised and unsupervised models.	**BT 5**

Paper III/Subject Name: Introduction to Internet of Things

Objective:

The objectives of this course are to make the students understand the vision, applications, market perspective of IOT from a global context.

Prerequisites: Concept of Computer Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of IoT	**BT 2**
CO 2	**Apply** the concepts learnt on embedded systems	**BT 3**
CO 3	**Analyze** the basic protocols in wireless sensor networks	**BT 4**

Paper IV/Subject Name: Introduction to Cloud Computing

Objective:
The objectives of the course are to explain current cloud computing technologies, large data processing and resource management in the cloud and analyze the components of cloud computing showing how business agility in an organization can be created.
Prerequisites: Concepts of Database Management Systems, Networking

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the core concepts of the cloud computing paradigm	BT 2
CO 2	**Apply** the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost	BT 3
CO 3	**Analyze** various cloud programming models and apply them to solve problems on the cloud	BT 4

Paper IV/Subject Name: Statistical Computing

Objective:
The objective of this course is to teach the basic rules of probability and to use them in modelling uncertainty in obtaining and recording data.
Prerequisites: Basic concepts of Mathematics

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** about the types of data, Mean and Median, Standard Deviation and Variance, Range, IQR and Finding Outliers etc.	BT 1
CO 2	**Illustrate** Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable etc.	BT 2
CO 3	**Apply** Sampling Distribution, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation, Point estimation on datasets	BT 3
CO 4	**Analyse** Linear regression and testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line etc.	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-IX/X)

Paper V/Subject Name: Ethics and Business Communication

Objective:

The objectives of the course are to introduce students to truthfulness, accuracy, honesty, and reason as essential to the integrity of communication skills to make moral decisions.
Prerequisites: Previous knowledge of communication

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** ethical awareness and the ability to do ethical reflection.	BT 2
CO 2	**Apply** ethical principles in decision-making	BT 3

Detailed Syllabus of Value-Added Course (VAC-IV)

Paper VII/Subject Name: General Awareness for Competitive Examinations

Objective:

The objective of the course is to prepare the students to solve reasoning and quantitative aptitude problems which are asked during most of the interview processes
Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** various formulas for solving problems	BT 1
CO 2	**Illustrate** the problems quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem	BT 2
CO 3	**Apply** various formulas and methodology from the course to solve a problem	BT 3
CO 4	**Analyse** quantitative information (i.e., formulas, graphs, tables, models, and schematics) or reasoning information and draw	BT 4

SYLLABUS (6th SEMESTER)

Paper I/Subject Name: Artificial Intelligence

Objective:

The objectives of the course are to make the students learn the basic concepts of Artificial Intelligence along with its problem-solving techniques.

Prerequisites: Concepts of Mathematics, Programming Languages, Data Analytic Techniques

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** and manipulate a given problem in the language/framework of different AI methods.	BT 2
CO 2	**Identify** problems that are amenable to solution by AI methods.	BT 3
CO 3	**Analyze** and **assess** basic AI algorithms for their applications.	BT 4 & 5

Paper II/Subject Name: Software Engineering

Objective:

The objectives of the course are to explain the fundaments of software engineering principles and practices, including project management, configurations management, requirements definition, system analysis, design, testing, and deployment.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the various phases of project development.	BT 2
CO 2	**Select** appropriate process model for development depending on the user requirements.	BT 3
CO 3	**Analyze** and **assess** the model developed in terms of risks management and reuse.	BT 4 & 5

Software Engineering Lab

Objective:

The objectives of the course are to teach the students the generic software development skill through various stages of software life cycle and to ensure the quality of software through software development with various protocol-based environment.

Prerequisites: Computer Programming Fundamentals

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and describe basic concept of UML, design, implementation of test cases	**BT 2**
CO 2	**Construct** various UML diagrams for different applications	**BT 3**
CO 3	**Analyze** how to develop software requirements specifications for a given problem	**BT 4**

Detailed Syllabus of Discipline Specific Elective (DSE-V/VI/VII)

Paper III/Subject Name: Introduction to Big Data Analytics

Objective:

The objectives of the course are to make the students analyse the components of cloud computing and its business perspective and to explain evaluation of the various cloud development tools.

Prerequisites: Concepts of Databases and Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** how to leverage the insights from big data analytics and the various NoSql alternative database models.	**BT 2**
CO 2	**Apply** different analytic techniques on real-time streaming data	**BT 3**
CO 3	**Analyze** resultant data using various statistical measures	**BT 4 & 5**

Paper III/Subject Name: Mobile Application Development

Objective:

The objectives of the course are to teach the maintenance of a Unix/Linux server and to explain connecting a Unix/Linux server to the network, and share resources on the network.

Prerequisites: Fundamental concepts of Computer Programming using C++/JAVA

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts behind application development	BT 2
CO 2	**Apply** the techniques learnt to develop new apps	BT 3
CO 3	**Analyze** the existing applications and fix the errors in it	BT 4 & 5

Paper IV/Subject Name: Mobile Computing

Objective:

The objectives of the course are to teach the concept of mobile computing paradigm, its applications and limitations, typical mobile networking infrastructure through a popular GSM protocol.

Prerequisites: Concepts of Computer Networks

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** mobile technologies in terms of hardware, software, and communications and describe how mobile technology functions to enable other computing technologies.	BT 2
CO 2	**Utilize** mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures.	BT 3
CO 3	**Analyze** any new technical issues related to new paradigm and come up with a solution(s).	BT 4
CO 4	**Evaluate** the effectiveness of different mobile computing frameworks.	BT 5

Paper III/Subject Name: Introduction to Embedded Systems

Objective:

The objectives of the course are to make the students understand and design embedded systems and real-time systems.

Prerequisites: Fundamental Concepts of Digital Logic, C Programming and Microprocessor

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and identify the unique characteristics of real-time systems	BT 2
CO 2	**Apply** real-time systems design techniques to various software programs.	BT 3
CO 3	**Analyze** the unique design problems and challenges of real-time systems	BT 4

Paper V/Subject Name: Cryptography and Network Security

Objective:

The objectives of the course are to explain the basics of cryptography, kinds of security threats in networks and to learn to find the vulnerabilities in programs and to overcome them and to teach about the models and standards for security.

Prerequisites: Concepts of Number Theory and Networking

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and **illustrate** basic cryptographic algorithms, message and web authentication and security issues.	BT 2
CO 2	**Demonstrate** the current legal and ethical issues towards information.	BT 2
CO 3	**Identify** the applications of different protocol like SSL, TLS etc.	BT 3
CO 4	**Analyze** and **assess** the security services and mechanisms	BT 4

Paper IV/Subject Name: Introduction to Natural Language Processing

Objective:

The objectives of the course to provide the student with knowledge of various levels of analysis involved in NLP and teach different language modelling.

Prerequisites: Basics of Discreet Mathematics

Course Outcomes

SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the fundamental concepts of Natural Language Processing	BT2
CO 2	**Apply** algorithms for NLP tasks.	BT 3
CO 3	**Test** useful systems for language processing and related tasks involving text processing	BT 4

Detailed Syllabus of Ability Enhancement Compulsory Courses (AECC-XI/XII)

Paper VI/Subject Name: Effective Workplace Communication

Objective:

The objectives of the course are to introduce students to areas of concern in the workplace environment like culture, business etiquettes, decision making, and workplace interpersonal relationships

Prerequisites: Basic knowledge of interpersonal communication and organizational communication paradigms.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** business culture, business etiquettes, decision making, and workplace interpersonal relationships.	BT 2
CO 2	**Apply** the concepts learnt in real life for professional and corporate communication.	BT 3

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Detailed Syllabus of Skill Enhancement Course (SEC-IV)

Paper III/Subject Name: Data Analytics with Python

Objective:

The objectives of the course are to provide a basic understanding of Python programming language and its use in Data Science.

Prerequisites: None

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** basic data processing concepts in python	BT 2
CO 2	**Compare** and **contrast** different python packages for data processing	BT 2
CO 3	**Develop** Data Science Project using open-source technologies	BT 3
CO 4	**Apply** Data Processing, Visualization and Analytical techniques on data set	BT 3

Detailed Syllabus of Value-Added Course (VAC-V)

Paper III/Subject Name: Programming with R		Subject Code: VAC992V609
L-T-P-C - 3-0-1-4	Credit Units: 04	Scheme of Evaluation: TP

Objective:

The objectives of the course are to provide an understanding to the students about basic programming in R and its use is data visualization.

Prerequisites: Basics of any Programming language

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of R programming	BT 2
CO 2	**Build** new packages for sharing and reusability	BT 3
CO 3	**Design** application with database connectivity for data analysis	BT 3
CO 4	**Analyse** data from different sources using API	BT 4

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Programme Outcomes and Course Outcome

B.Sc-Botany

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd 2018

Anuradha Dev

Director, IQAC
The Assam Royal Global University

Nature and Extent of Bachelor's Degree Programme in Botany (Honours)

A student pursuing 4 years undergraduate programme with research in a specific discipline shall be awarded an appropriate Degree in that discipline on completion of 8th Semester if he/she secures 180 Credits. An illustration of credits requirements in relation to the type of award is illustrated below:

Sl. No.	YEAR	Mandatory Credits to be secured for the Award
1	After successful completion of 1st Year	48
2	After successful completion of 1st and 2nd Years	96
3	After successful completion of 1st, 2nd, and 3rd Years	148
4	After successful completion of 1st, 2nd, 3rd, and 4th Years	180

Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

Bachelor's Degree (Honours) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, BSc (Honours) Course in Botany aims to equip the students to qualify for joining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

Program Learning Outcomes relating to BSc Botany (Honours) degree Programme in Botany:

The student graduating with the Degree B.Sc. (Honours) Botany should be able to acquire

PO 1: Knowledge of Botany : Students will acquire core competency in the subject Botany, and in allied subject areas.

- The student will be able to identify major groups of plants and compare the characteristics of lower (e.g. algae and fungi) and higher (angiosperms and gymnosperms) plants.
- Students will be able to use the evidence based comparative botany approach to explain the evolution of organism and understand the genetic diversity on the earth.
- The students will be able to explain various plant processes and functions, metabolism, concepts of gene, genome and how organism's function is influenced at the cell, tissue and organ level.
- Students will be able to understand adaptation, development and behaviour of different forms of life.

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- The understanding of networked life on earth and tracing the energy pyramids through nutrient flow is expected from the students.
- Students will be able to demonstrate the experimental techniques and methods of their area of specialization in Botany.

PO 2:Critical Thinking and problem solving ability: An increased understanding of fundamental concepts and their applications of scientific principles is expected at the end of this course. Students will become critical thinker and acquire problem solving capabilities.

PO 3: Digitally equipped: Students will acquire digital skills and integrate the fundamental concepts with modern tools.

PO 4: Ethical and Psychological strengthening: Students will also strengthen their ethical and moral values and shall be able to deal with psychological weaknesses.

PO 5: Team Player: Students will learn team workmanship in order to serve efficiently institutions, industry and society.

PO 6: Independent Learner: Apart from the subject specific skills, generic skills, especially in botany, the program outcome would lead to gain knowledge and skills for further higher studies, competitive examinations and employment. Learning outcomes based curriculum would ensure equal academic standards across the country and broader picture of their competencies. The Bachelor program in Botany and Botany honours may be mono-disciplinary or multidisciplinary.

1.5 Programme specific Learning Outcomes

Programme Specific Outcomes (PSOs):

PSO1. A student completing the course is able to understand different specializations of Botany such as systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various life-forms.

PSO2. The student completing the course is trained in various analytical techniques of plant biology, use of plants as industrial resources or as human livelihood support system and is well versed with the use of transgenic technologies for basic and applied research in plants.

PSO3. The student completing the course is able to identify various life forms of plants, design and execute experiments related to basic studies on evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, proteomics and transgenic technology. Students are also familiarized with the use of bioinformatics tools and databases and in the application of statistics to biological data.

PSO4. The student completing the course is capable of executing short research projects incorporating various tools and techniques in any of the basic specializations of Plant Sciences under supervision.

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Paper I: MICROBIOLOGY, MYCOLOGY AND PHYTOPATHOLOGY,

Course Objective: To introduce and develop basic concepts to the world of microbes focusing on the diversity and fundamental biological processes of bacteria, viruses & algae.

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: To **describe** the physical dimensions, forms, functions and habitats of bacteria, Plant & animal viruses, the diversity of algae, the ecological role of Fungi and the biotechnological application of certain species of all the three groups – **BT 2**

CO2: To **distinguish** between the micro and macro forms of life and their value addition to the environment. - **BT 2**

CO3: To **illustrate** the differences between the antagonistic and beneficial roles of bacteria, viruses& Fungi in the plant kingdom. – **BT 3**

Paper II: ALGAE, BRYOPHYTES AND PTERIDOPHYTES

Course Objective: To introduce the students to the diversity and type study of Cryptogams, their economic importance, and their evolution to present times.

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: The course shall **infer** the students with the understanding of the wide diversity of cryptogams, their economical, ecological & evolutionary variations and roles.**BT -2**

CO2: The learners shall **develop** an understanding of the transition of early land plants from aquatic to terrestrial habitats.**BT-5**

CO3: The students shall be able to **outline** the applications of phycology, bryology & pteridology.**BT -5**

Paper III: MICROBIOLOGY, MYCOLOGY, PHYTOPATHOLOGY & CRYPTOGAMS(PRACTICAL)

Course Objective: To introduce the students to the world of microbes by showing them live cultures and photographs and enable the students to have a hands-on experience of observing of bacteria, viruses, fungi, and cryptogams

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: **Employ** practical knowledge of microns, fungi, as well as lower plants such as algae, bryophytes and pteridophytes.**BT - 3**

CO2: **Discover** plant diseases bases on symptoms.**BT - 3**

CO3: **Examine** cell structures under microscopes.**BT - 4**

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AECC - 1

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

CO1: Have a knowledge of Communication process, verbal, and non-verbal communication.
CO2: Improve the skill of listening processes.
CO3: Develop a life skill on oral group communication- group discussion leadership skills, team management.
CO4: Have a basic idea of language styles – oral and written communication.

AECC-2/Subject Name: Behavioural Science – I

Course Objective: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

CO1: Understand self-identity and identity crisis
CO2: Understand self-esteem.
CO3: Have in depth knowledge of foundation of individual behaviour.
CO4: Develop a life skill on Time management
CO5: Have an idea on barriers of communication.

PAPER GE 1: BIODIVERSITY IN PLANTS

Course Objective: Develop an understanding of the various groups of Plant kingdom and Acquire knowledge about the evolution from lower plants to higher plants in the Plant kingdom.

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: **Recognize** various plant groups of plants from primitive to highly evolved. **BT 1**
CO2: **Infer** foundation for further studies in Botany.**BT 2**

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PAPER GE 2: NURSERY AND GARDENING

Course Objective: To enable the students about different branches of nursery and gardening, importance and scope of with reference to propagation techniques, canopy management, intercultural practices, diseases and disorders of nursery crops.

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: **Recognize** various plant types and their propagation methods.**BT 1**

CO2: **Produce** entrepreneurial aspects by studying various commercialization and economic benefits of plant propagation and cultivation.**BT 2**

CO3: **Relate** various propagation and cultivation methods with the types of plant in different gardens. **BT 4**

SEC/Subject Name: PLANT PROPAGATION & NURSERY MANAGEMENT

Course Objective: To inculcate the importance of studying horticultural practices and usage of horticultural Crops and to impart the basic skills of entrepreneurship in the students specifically in the field of horticulture

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: **Label** various practical application of different horticultural practices. **BT 1**

CO2: **Discover** with the horticulture based industries at national and international level.**BT 3**

Paper I: GYMNOSPERMS & ANGIOSPERMS

Course Objective: To introduce the students to the world of phanerogams and their evolutionary significance, their detailed taxonomy, and their life cycles.

Course Outcomes: After the successful completion of the course the students will be able to:

CO1: **Identify** the phanerogams, their vegetative and reproductive structures and their importance. **BT 1**

CO2: **Explain** evolutionary lines in each group of gymnosperms and angiosperms. **BT 2**

CO3: **Relate** the differences and the affinities between the Gymnosperms & Angiosperms. **BT 3**

Paper II: PLANT ANATOMY &TAXONOMY

Course Objective: to introduce the students to the different tissue systems in angiosperms and how they function, their developmental theories of root and shoot development.

Course Outcomes After the successful completion of the course the students will be able to:

CO1: **Recognize** the various tissue organization of the plant body **BT 1**

CO2: **Describe** the development and functions of various tissue systems inside the plant body.**BT 2**

CO3: **Analyze** special types of anatomical adaptations in xerophytes and hydrophytes. **BT 4**

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Paper III: GYMNOSPERMS, ANGIOSPERMS, PLANT TAXONOMY & ANATOMY (PRACTICAL)

Course Objective: To impart practical knowledge on various group of archegoniates, have a clear concept on cellular structure of plants by microscopic observation, have a hands on experience on economically important plant parts used and do microchemical tests to observe the molecules present there

Course Outcomes

CO1: The course will help the students to gain practical knowledge of vascular plants.
CO2: They will be equipped to identify various anatomical structures of plant body.
CO3: They will be able to identify economic importance of various plants.

AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

CO1: Improve speaking skill.
CO2: Develop a life skill on conversation.
CO3: Improve the skill of public speaking.

AECC-4/Subject Name: Behavioural Science - II

Course Objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

CO1: Understand culture and personality
CO2: Understand Value.
CO3: Demonstrate leadership.
CO4: Develop a life skill on motivation

PAPER GE 3: MUSHROOM CULTIVATION,

Course Objective: To Identify edible types in mushroom, Selection of appropriate cultivation sites, Designing and construction of Mushroom Farm, Packaging, storing and grading of Mushrooms.

Course Outcomes: On completion of this course students will be expected to -

CO1: **Identify** of prospects of Mushroom cultivation **BT 2**
CO2: **Illustrate** cultivation of different types of edible Mushroom.**BT 3**
CO3: **Outline** concepts on the methods of harvesting of Mushroom and methods of grading, packing and storing of Mushroom.**BT**

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PAPER GE 4: PLANT ECOLOGY AND ECONOMIC BOTANY

Course Objective: To impart knowledge on interaction of plants with surrounding environments, on economic use of plants and their distribution

Course Outcomes: On completion of this course students will be expected to –

CO1: **Define** various plant interactions and ecological factors. **BT 1**
CO2: **Describe** various application of plants for different economic uses. **BT 2**

SEC/Subject Name: PLANT PROPAGATION & NURSERY MANAGEMENT: HORTICULTURE

Course Objective: To inculcate the importance of studying horticultural practices and usage of horticultural Crops and impart the basic skills of entrepreneurship in the students specifically in the field of horticulture.

Course Outcomes: On completion of this course students will be expected to:

CO1: define the scope and concept of the horticulture. BT 1
CO2: **Discover** plant propagating media. BT 3
CO3: **Analyse** sowing of seeds and plant cuttings in different media. BT 4
CO4: **Identify** preparation of nursery seed beds. BT 4

Paper I: GENETICS & PLANT BREEDING

Course Objective: To acquaint the students about the basics of plant genetics and heredity.

Course Outcomes:

CO1: Describe Mendel as well as chromosomal basis of inheritance **[BT2]**

CO2: Predict the basis of inheritance and variation caused due to mutation and aberrations. **[BT3]**

CO3: Evaluate the techniques to create new varieties with a set of desired characteristics. [BT4]

Paper II: ECONOMIC BOTANY

Course Objective: To enable the students to have an understanding on how cultivated plants originated and how they are introduced across the world.

Course Outcomes:

CO1: Explain a brief idea on various methods used for extraction of various plant products like rubber etc., and **outline** the industrial applications of different plant parts for economic purposes **[BT2]**

CO2: Experiment with various uses of plants in day-to-day life. **[BT3]**

CO3: Discover an understanding of the economic aspects of various plants. **[BT4]**

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Paper II: GENETICS, PLANT BREEDING & ECONOMIC BOTANY(PRACTICAL)

Course Objective: The course aims to teach to student the bases of basic research in cellular and molecular biology, introduce them to the preliminary bioinformatic tools that will help them reaching the correct conclusions from their experimental results.

Course Outcomes: At the end of the course the student will be able to:

- **CO1:** **Reproduce** the different cell division techniques. **BT 1**
- **CO2:** **Demonstrate** molecular biology techniques like DNA isolation, spectrophotometric analysis PCR. **BT 3**
- **CO3:** **Relate** about the economic and commercial importance of plants BT 4

PAPER GE 5: BOTANY IN RURAL COMMUNITIES,

Course Objective: To impart knowledge on rural areas use of plants and also basic concept of ethnobotany

Course Outcomes: On completion of this course students will be expected to –:

- CO1: **Describe** various Traditional methods of medical treatments in Rural Communities of India BT 2
- CO2: **Compute** the traditional knowledge of prominent tribes of Assam BT 3
- CO3: **Infer** the applications of the ethnomedicine in modern pharmaceutical systems. BT 4

PAPER GE 6: NURSERY AND GARDENING

Course Objective: To enable the students about different branches of nursery and gardening, importance and scope of with reference to propagation techniques, canopy management, intercultural practices, diseases and disorders of nursery crops.

Course Outcomes: After the successful completion of the course the students will be able to:

- CO1: **Recognize** various plant types and their propagation methods.**BT 1**
- CO2: **Produce** entrepreneurial aspects by studying various commercialization and economic benefits of plant propagation and cultivation.**BT 2**
- CO3: **Relate** various propegation and cultivation methods with the types of plant in different gardens. **BT 3**

Paper I: PLANT PHYSIOLOGY& BIOCHEMISTRY

Course Objective: To acquaint the students with the various physiological processes inside the plant body and understand the important life processes of plants.

Course Outcomes: On completion of this course students will be expected to –

CO1: **Describe** different physiological processes of plants on completion of this course. BT 2
CO2: **Discover**ideas on different factors effecting the physiological process. BT 3
CO3: **Distinguish** between various types of Biomolecules and their application in Plant sciences. BT 4

Paper II: PLANT PHYSIOLOGY, BIOCHEMISTRY & HERBARIUM TECHNIQUES (

Course objective: To impart practical knowledge on various physiological and metabolic processes of plants.

Course Outcomes: at the end of the course the student will be:

CO1: **Interpret** the various processes of metabolism in plants. BT 3
CO2: **Examine & Test** different physiological processes of angiosperms through laboratory experiments. BT 3 & BT 4

Paper I: PLANT IDENTIFICATION AND HERBARIUM TECHNIQUES

Course objective: To impart practical knowledge on various plant identification systems, their preservation and utilization.

Course Outcomes: At the end of the course the student will be:

CO1: **Identify, describe,** and practice different methods of plant identification systems BT 2 & 3
CO2: **Categorise** different techniques used in preservation and utilize its knowledge in various field application. BT 4

PAPER GE 7: ENVIRONMENTAL BIOTECHNOLOGY

Course Objective : To impart knowledge on environmental technology and its application.

Course Outcomes: On completion of this course students will be expected to –

CO1: **Define** various applications of technology in the environment. BT 1
CO2: Describe various Natural & Renewable Resources in the Environment and their applications. BT 2
CO3: Distinguish between various types of Pollution, their causes, consequence and their mitigation measures. BT 4

PAPER GE 8: PLANT ECOLOGY AND ECONOMIC BOTANY

Course Objective: To impart knowledge on interaction of plants with surrounding environments, on economic use of plants and their distribution

Course Outcomes: On completion of this course students will be expected to –

CO1: **Define** various plant interactions and ecological factors.**BT 1**
CO2: **Describe** various application of plants for different economic uses.**BT 2**

SEC: FLORICULTURE I

Course Objective: The student will learn the Techniques of floriculture its Economic importance of different plants used in floriculture and Commercial aspect of floriculture

Course Outcome: On completion of this course students will be expected to -

CO1: Recognizefield based application on flower cultivation and marketing. BT 1

CO2: Identify gerdening techniques for different flowers. BT 2

DETAILED SYLLABUS OF 5TH SEMESTER

PAPER I: CELL & MOLECULAR BIOLOGY

Course Objective: The present course has been devised to familiarize students with the structural and functional aspects of cell, the basic unit of life, and its different organelles. We aim to transmit the student how morphology, structure and function are connected. Also the course will familiarize students with the concept of molecular biology: understanding the process of replication, transcription and translation and learning how these are regulated

Course Outcomes: On completion of this course students will be expected to –

CO1: **Describe** the components of cells and how cell organelles interact with each other to carry out the fundamental biological process. BT 1
CO2: **Express** significance of cell division for multicellular organism and the key events that happen during cell cycle. BT 2
CO3: **Discover** Central Dogma of life and understand the regulation of gene expression. BT3

Paper II: MOLECULAR BIOLOGY, BIOSTATISTICS, BIOINFORMATICS & APPLIED MICROBIOLOGY (PRACTICAL)

Course Objective: To impart practical knowledge on various principles of genetics, give a idea on different cytological techniques, special chromosomes, plant breeding, Biostatistics, Bioinformatics & Applied Microbiology

Course Outcomes: At the end of the course the student will be able to:

CO1: **Identify** different cytological techniques and plant breeding through laboratory experiments. **[BT 1]**

CO2: **Compute** and **Practice** different Biostatistical and informatics processes to analyze various data related to experiment. [BT 3]

CO3: **Experiment** different applied microbiological techniques in the laboratory. **[BT 4]**

DSE I: BIOSTATISTICS AND BIOINFORMATICS

Course Objective: The course is designed to apply programming language to understand biological data.

Course Outcomes: By the end of the course the students will be able to:

CO1:	**Outline and describe** the basic concepts of Bioinformatics and its significance in Biological data analysis.	[BT1 &BT2]
CO2:	**Compute and model out** various bioinformatic too to decipher the structural organisation, structural properties and structure determination of biological macromolecules – DNA, Protein and Carbohydrates.	[BT3 & BT4]
CO3:	**Interpret and demonstrate** statistical reasoning skills accurately and contextually	[BT3]
CO4:	**Apply** statistical knowledge to design and conduct research studies and also Operate statistical software packages to conduct research studies.	BT3 & BT4]

DSE II: INDUSTRIAL & ENVIRONMENTAL MICROBIOLOGY

Course Objectives: The course is designed to impart theoretical as well as practical knowledge on the diversity of microbes in the environment and their interaction in different areas. The course will also help the students understand the utilization of microorganisms in different categories of industries.

Course Outcomes: By the end of the course the students shall be able to:

CO1:	**Identify** different types of microorganisms found in the environment and **recognize** their contribution in eth environment.	**[BT1 & BT2]**
CO2:	**Outline** different application of microorganism in industries	**[BT4]**
CO3:	**Distinguish different diseases caused by** microbes from different sources such as air, soil, and water.	**[BT 4]**

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DETAILED SYLLABUS OF 6TH SEMESTER

PAPER I: ECOLOGY & CONSERVATION BIOLOGY

Course Objective: To acquaint the students about environment and its conservation, plant interactions and various concepts on plant communities and community succession in a particular habitat.

Course Outcomes: At the end of the course the student will be able to:

CO1	Identify how plants interact with their environment and understand patterns in ecosystem and knowledge across dimensions of ecological organization.	[BT 1]
CO2	Describe the different aspects of community ecology and dynamics of population.	[BT 2]
CO3	Analyze the importance of biodiversity conservation, flagship species in current backdrop of ecological loss and the aspect of human wildlife conflict, wildlife trade and related pandemics.	[BT 4]

Paper II: ECOLOGY, AGRONOMY AND BIORESOURCE MANAGEMENT (PRACTICAL)

Course Objective: To impart practical knowledge on various principles of ecology, agronomy and bioresource management.

Course Outcomes: At the end of the course the student will be able to:

CO 1	**Classify** different ecological processes as well interactions.	**BT 2**
CO 2	**Employ** different ecological tools to identify various ecosystem parameters related to diversity	**BT 3**
CO 3	**Model** different conservation measures to save the depletion of bioresources.	**BT 4**

DSE I: AGRONOMY & SUSTAINABLE DEVELOPMENT

Course Objective: The course is designed to inform the student about the various bioresources and its management.

Course Outcomes: By the end of the course the students will be able to:

CO1:	**Recognize** various bioresources, its types, application and their management	[BT 1]
CO2:	**Predict & Defend** the available bioresources near them.	[BT 2]
CO3:	**Relate** various protection laws and Acts to conservation strategies and management Practices.	[BT 4]

DSE II: BIORESOURCE MANAGEMENT

Course Objective: The course is designed to inform the student about the various bioresources and its management.

Course Outcomes: By the end of the course the students will be able to:

CO1:	**Recognize** various bioresources, its types, application and their management	[BT 1]
CO2:	**Predict & Defend** the available bioresources near them.	[BT 2]
CO3:	**Relate** various protection laws and Acts to conservation strategies and management Practices	[BT 4]

DSE III: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

Course Objective: The course is designed to inform the student about the various bioresources and its management.

Course Outcomes: By the end of the course the students will be able to:

CO1:	**Identify** the students about the development of flower, various stages of development of male and female gametophytes and the process of fertilization.	[BT 1]
CO2:	**Predict** various incompatibilities and hybridization process in plants.	[BT 3]
CO3:	**Compare** various types of embryo development and seed types in plants	[BT 4]

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DETAILED SYLLABUS OF 7TH SEMESTER

PAPER I: PLANT BIOTECHNOLOGY

Pre-requisite: Basic knowledge of biology and chemistry up to class 12

Course Objectives:

The course is designed to impart theoretical knowledge on various tissue culture media and sterilization techniques that are pre-requisite to plant tissue culture. The course will also help the students understand the plant genetic-transformation technique along with techniques to improve plants yield and quality by the application of plant biotechnology.

Course Outcomes:

By the end of the course the students shall be able to:

CO1: Classify different types of media and growth hormones hormones required for different tissue culture technique. **[BT2 & BT3]**

CO2: Outline different tissue culture techniques and their application. **[BT4]**

CO3: **Evaluate** strategies to develop Agrobacterium mediated plant transformation **[BT 4]**

PAPER I: GENETIC ENGINEERING IN PLANTS

Course Objectives:

The course will impart basic knowledge about different molecular techniques used in genetic engineering and their application.

Course Outcomes:

By the end of the course the students shall be able to:

1. **Describe and explain** various molecular tools required for gene cloning **[BT1 & BT2].**
2. **Relate and breakdown** different cloning strategies that would be undertaken according to the experiment required. **[BT3 & BT4]**
3. **Outline** and **devise** genetic engineering experiments. **[BT4]**

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Programme Outcomes and Course Outcome

B.Sc-Physics

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Anuradha Dev

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1.1.1. Nature of bachelor's degree programme in Physics (Honours)

Physics is the study of natural science. It has a wide range of applications in natural sciences, engineering, medical sciences etc. The key areas of study in Physics are:
Mechanics; Optics and laser; Waves and oscillation; Electricity and magnetism ; Electrodynamics; Thermodynamics; Concept of nucleus; Electronics; Atom and molecules; Matter and its constituent; Concept of crystal; Mathematical physics; Relativity; Quantum mechanics; Statistical mechanics; Digital system and applications; Astrophysics; Atoms and Molecular Physics; Laser Physics; Solid State Physics

The B.Sc. Physics course curriculum has been designed by considering the above branches of physics along with a few papers for skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level. The bachelor's degree in Physics is a 3 years degree course which is divided into 6 semesters as under.

1.2. Programme Learning Outcomes relating to BSc Honours degree programme in Physics

Students graduating with the degree BSc (Physics) will be able to achieve the following:

PO 1: Physics Knowledge: Apply the basic knowledge of physics to the solution of advance physics problems.

PO 2 : Conduct Investigations of Complex Problems : Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 3 : Problem Analysis: Identify, formulate, research literature, and analyze complex physics problems reaching substantiated conclusions using principle of physics.

PO 4: Communication: Communicate effectively on physic related activities with the community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, also give and receive clear instructions.

PO 5: Ethics, Individual and Team Work: Apply ethical principles and commit to professional ethics and responsibilities and norms of the physics practice. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 6: Design/Development of Solutions: Design solutions for advanced physics problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO 7: The physics and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional physics application.

PO 8: Environment and Sustainability: Understand the impact of the applied physics solutions in societal and environmental contexts, and demonstrate the knowledge for sustainable development.

1.3. B.Sc Physics Programme Specific Outcomes

PSO1: Building a critical understanding of the subject matters to conduct research and analyse complex problems in physics.

PSO2: Communicate the concept of physics in effective ways individually or as a team member.

PSO3: Apply the concept of physics to develop new and innovative ideas/solutions in physics and allied fields for the society and the environment at large.

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Title of the Paper: Mechanics

Course Objectives:

This course begins with the review of Newton's Laws of Motion and ends with the Fictitious Forces and Special Theory of Relativity and to develop the understanding of Collisions in center of mass (CM) frame, Gravitation, Rotational Motion and Oscillations.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**remember** Newton's laws of motion and applications.	BT 1
CO 2	**understand** the concept of inertial reference frames and Galilean transformations, conservation of energy, momentum, angular momenta, the analogy between transnational and rotational dynamics, variable mass system and dynamics of a	BT 2
CO 3	**apply** the concept of moment of inertia about the given axis of symmetry for different uniform mass distributions, the phenomena of collisions and idea about center of mass and laboratory frames.	BT 3
CO 4	**analyze** the concept of different type of elastic constants, energy in a strained body, bending moment, cantilever, the concept of flow of Liquids, simple harmonic motion, Centrifugal force and Coriolis forces, special theory of relativity.	BT 4

Title of the Paper: Mathematical Physics I

Course objectives: This course will help the students to understand, apply, analyze, and evaluate different physical systems using the mathematical concepts like vector algebra, matrices, special function, etc.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**remember** different topics like vectors, scalar, different types of matrices, gamma function, periodic function, Fourier series etc.	BT 1
CO 2	**understand** Gradient of a scalar field, Divergence and curl of a vector field, Rodrigues' Formulae, Legendre's polynomial etc.	BT 2
CO 3	**apply** the topics Length, area and volume elements in different coordinate system, Legendre's Hermite differential equation, equally likely, independent events etc.	BT 3
CO 4	**analyze** and evaluate different problems of distinguished topics like gradient, divergence, curl, eigen value, eigen vector, Bessel's function, probability distributions etc.	BT 4

Title of the Paper: Physics Lab I

Course Objective:
To familiarize with different basic experiments of Physics and to understand the working of different devices like M1 table, Kater's pendulum etc.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Find** different physical devices	**BT 1**
CO 2	**Demonstrate** different mechanisms like Searle's Apparatus, capillary tube etc.	**BT 2**
CO 3	**Apply** different methods in experiment.	**BT 3**
CO 4	**Analyze** different experimental results with error calculations.	**BT 4**

Title of the Paper: Physics workshop skills

Course Objective:
To develop the foundation of physical laws and theory related to laboratory physics, and hands on skill of measurement instruments, optics, elasticity and electricity.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**recall** vernier scale, screw gauge, spherometer, spectrometer, prism optical bench, Young's modulus instrument.	**BT 1**
CO 2	**demonstrate** the logic and principles behind the measurement techniques.	**BT 2**
CO 3	**apply** the knowledge to measure small distances, diameter and radius of rods, Young's modulus, image distance and focal distances of lens, prism parameter etc.	**BT 3**
CO 4	**discover** skills to perform the experiments to solve real problems related to above mentioned apparatuses.	**BT 4**

Title of the Paper: Fundamentals of Physics

Course Objective: To give some basics knowledge of mathematical physics, rotational motion,electricity, thermodynamics and modern physics

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**remember** the nature of differential equations, laws of rotational motion, laws of thermodynamics	BT 1
CO 2	**understand** a few primary concepts of mathematical physics, rotational motion,electricity, thermodynamics and modern physics	BT 2
CO 3	**apply** different laws of mathematical physics, electricity, rotational motion , thermodynamics to solve different physics related problems.	BT 3
CO 4	**analyze** the effect of different mathematical operations on a physical parameters, importance to rotational axis, effects of electricity in different circuit elements and effect of temperature in a thermodynamics system.	BT 4

Title of the Paper: Physics of Earth

Course Objectives: The course is an introduction to physics of the solid Earth intended for students with substantial background in physics. The course will provide an overview of the structure and evolution of the Earth as a dynamic planet within our solar system.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**remember** the basic terms associated with the seismology, Earth magnetic field, geomagnetic files and Atmosphere	BT 1
CO 2	**understand** the theoretical basis for modern global seismology and employ methods based on such theory earthquake phenomena and the seismological probing of earth structure.	BT 2
CO 3	**apply** the governing dynamics of mantle and lithosphere, and use such understanding to make reliable estimates of the forces controlling plate motions and their temporal changes.	BT 3
CO 4	**analyze** the vertical structure of the atmosphere in connection to the basic thermodynamics and also about the climate dynamics: Present day climate-Climate variability –Climate sensitivity and feedback – Global warming – Climate monitoring and prediction etc.	BT 4

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Title of the Paper: Electricity and Magnetism

Course Objective:
To develop the strong foundation for electricity and magnetism for application in practical field and analytical concept of electricity, basic laws of electricity, magnetism

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**define** the phenomena of electrical fields and the properties for basic phenomena.	**BT 1**
CO 2	**understand** the properties and importance of polarization, susceptibilities, dielectric constants.	**BT 2**
CO 3	**apply** electric and magnetic properties for different material and study the characteristic output.	**BT 3**
CO 4	**analyze** different formula and solve numerical of alternating current, Kirchhoff's law, LCR, RC, RLC Circuits.	**BT 4**

Title of the Paper: Thermal and Statistical Physics

Course Objectives: The objective of this course is to learn how to apply thermodynamic principles in order to interpret thermodynamic systems and to become familiar with the use of simple statistical mechanical models to predict thermodynamic properties.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**remember** the statistical nature of particles, concepts and laws in thermodynamics	**BT 1**
CO 2	**understand** entropy, temperature, Free energies, and partition functions, etc.	**BT 2**
CO 3	**apply** the concepts and laws of thermodynamics to solve problems in thermodynamic systems such as gases, heat engines and refrigerators etc.	**BT 3**
CO 4	**analyze** the statistical physics methods, such as Boltzmann distribution, Gibbs distribution, Fermi-Dirac and Bose-Einstein distributions to solve problems in some physical systems.	**BT 4**

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Title of the Paper: Physics Lab II

Course Objective:

To familiarize with different basic experiments of Physics and to understand the working of different devices like lenses, biprism, zener diode etc.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Find** different physical devices	**BT 1**
CO 2	**Demonstrate** different mechanisms like statical method, Newtons's ring method etc.	**BT 2**
CO 3	**Apply** different methods in experiments.	**BT 3**
CO 4	**Analyse** different experimental results with error calculations.	**BT 4**

Title of the Paper: Electrical Circuit and Network Skills

Course Objective:

To acquaint the student with different electrical elements/device and their working to apply in different electrical circuit

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**find** different electrical devices	**BT 1**
CO 2	**understand** the working of different electrical elements/devices	**BT 2**
CO 3	**apply** different electrical elements to design electrical circuits	**BT 3**
CO 4	**analyse** the output of different electrical circuits.	**BT 4**

Title of the Paper: Basics of Practical Physics

Course Objective:

To develop the foundation of physical laws and theory related to laboratory physics and to understand the use of vernier scale, screw gause, post office box, meter bridge, rigidity modulus instrument.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recall** vernier scale, screw gauge, post office box, meter bridge, rigidity modulus instrument etc.	**BT 1**
CO 2	**Understand** the logic gates and principles behind the measurement techniques	**BT 2**
CO 3	**Apply** the knowledge to measure small distances, diameter and radius of rods voltage drops, rigidity etc.	**BT 3**
CO 4	**Analyze** formula and solve numerical of small distance measurement, emf determination, unknown resistance determination, light intensity measurement, truth table of logic gates.	**BT 4**

Title of the Paper: Optics and Atomic Physics

Course Objective:

To develop the foundation of optical phenomena's such as reflection, refraction, interference, diffraction and atomic models and electronic transition to understand analytical concept of image formation, interference fringe formation and diffraction pattern formation.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the differences between particle and wave theory of light,the differences between particle and wave theory of light.	**BT 1**
CO 2	**Understand** propagation of light in wave theory and image formation. Laws of reflection and refraction	**BT 2**
CO 3	**Apply** the knowledge of optics atomic physics to measure image distances, fring width of interference, intensity profile of diffracted light, electrons energy in its orbit wavelength of light emitted during atomic transition.	**BT 3**
CO 4	**Analyze** relationship of atomic radius, energy and transition equation and Huygens wave theory of light.	**BT 4**

Title of the Paper: Ray and Wave Optics

Course Objectives:

The student shall master the geometrical approximation, including thin lens formula, Fermat's and Huygen's principles, Lens Aberration and the paraxial matrix formalism for refractive and reflective surfaces. The wave optics part of the course will give the student a basic knowledge within interferometer, polarization, diffraction and resolution, and the basics of coherent and non-coherent light sources. The student shall become able to analyze and calculate interference between plane waves and spherical waves, reflection and transmission of plane waves, and optical wave guiding within thin plates and optical fibers. The student shall understand how the polarization of light changes at reflection and transmission at interfaces.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** Fermat's principle, the ray equation, and the thick lenses equation as three equivalent statements of the laws of geometrical optics.	**BT 1**
CO 2	**Understand** optical phenomena such as interference, diffraction, polarisation, and birefringence.	**BT 2**
CO 3	**Solve** problems related to optical aberrations, image formation and wavelength determination, interferences fringes and intensity profile identification.	**BT 3**
CO 4	**Identify** and **analyze** the use of normal and polarized light in thin film and birefringent materials.	**BT 4**

Title of the Paper: Mathematical Physics-II

Course objectives: This course will help the students to understand, apply, analyze, and evaluate different physical systems using the mathematical concepts like integration of vectors, complex variables, special techniques to solve numerical integration etc.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** different topics like ordinary integration of vectors, Argand diagram, modulus complex function, order and degree of differential equation, Linear differential equation, Understanding of Numerical Integration etc.	**BT 1**
CO 2	**Understand** Line integral, surface integral and volume integrals, complex numbers, differential equation, different integral problems using Trapezoidal rule etc.	**BT 2**
CO 3	**Apply** the topics like Gauss' divergence theorem, Green's theorem, Auxiliary equations , weights and arguments, etc.	**BT 3**
CO 4	**Analyze and evaluate** different problems of distinguished topics like Stoke's theorem, analyticity, Frobenius method, Simpson's 1/3 rd rule, etc.	**BT 4**

Title of the Paper: Atmospheric Physics

Course Objectives: Upon completion of this course the student will be able to understand the different physical and chemical processes such as the origin of the atmosphere, atmospheric thermodynamics, atmospheric radiation and cloud precipitation.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** various applications measuring methods for atmospheric parameters.	BT 1
CO 2	**Understand** atmospheric and climate-change processes.	BT 2
CO 3	**apply** knowledge of atmospheric and climate change processes to fundamental physical principles.	BT 3
CO 4	**Identify and analyze** the fundamental numerical methods found in predictive models of weather and atmospheric climate change, including parameterization of small scale processes.	BT 4

Title of the Paper: Geophysics

Course Objectives: Upon completion of this course the student will be able to understand, apply, analyze and evaluate the different application of geophysics like the physical conditions of the Earth's multi-layered interior, Earth's magnetism, occurrence of earthquake and volcanoes etc.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basics composition of different layers inside the earths crust and above the lithosphere	BT 1
CO 2	**Understand** the principles of physical and historical geology with special emphasis on the unifying theory of plate tectonics and the linkage between geological processes and global biogeochemical cycles.	BT 2
CO 3	**Apply** geological observations and measurements to problems involving the timing of geological events in Earth history.	BT 3
CO 4	**Analyze** the key biological, chemical and physical Earth structures, processes, the interactions between them, and the roles that they play in determining the state of the Earth system.	BT 4

Title of the Paper: Theory of Relativity

Course Objectives:
This course emphasis to enhance the understanding of the basics of Relativity with respect to space and time. To impart the concept of different frame of references. To familiarize the understanding of Newtonian relativity, Galilean Transformation equations and special theory of Relativity. To impart the elementary concept of General Theory of Relativity.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the concept of space, time and mass, frame of reference, Newtonian relativity, Michelson-Morley experiment, the elementary concept of General Theory of Relativity.	**BT 1**
CO 2	**Understand** Postulates of special theory of Relativity, Lorentz transformation, Doppler Effect, Space-time diagram, General Theory of Relativity (Elementary).	**BT 2**
CO 3	**Apply** the concepts of length contraction and time dilation to solve problems.	**BT 3**
CO 4	**Analyze** the special and general theory of relativity .	**BT 4**

Title of the Paper: Electricity and Magnetism

Course Objectives: To develop strong foundation in the field of electric and magnetic phenomena, both in their physical basis and in the mode of mathematical description.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the principles of electric and magnetic field and their properties	**BT 1**
CO 2	**Understand** the concept of alternating current in LR, CR and LCR circuits.	**BT 2**
CO 3	**Solve** problems relating to Kirchhoff's law, LCR, CR and LR circuits.	**BT 3**
CO 4	**Analyze** the concept of electric and magnetic field to different condition.	**BT 4**

Title of the Paper: Introduction to Astrophysics

Course Objectives: Astrophysics is the physics of the stars. Therefore this course is intended to introduce the theoretical concept for a clear understanding of the astronomical phenomena.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** theoretical and practical aspects of modern observational astronomy, Photometry, spectroscopy, stellar classification, detectors, and basic information of telescopes.	R
CO 2	**Understand** the fundamentals in the Astrophysics like the classification of stars, stellar evolution, interstellar matter, galaxies etc.	BT 2
CO 3	**Apply** knowledge of astrophysics to practical application of observational techniques.	BT 3
CO 4	**Analyze** and evaluate astrophysical calculations of fundamental character.	BT 4

Title of the Paper: Quantum Mechanics

Course objectives: This course will help the students to understand, apply, analyze, and evaluate different physical systems of micro-world using different topics of quantum mechanics like Planck's hypothesis, de-Broglie hypothesis, probability density, quantum harmonic oscillator etc.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** different topics like Inadequacies of classical Physics, wave function, Schrodinger's equation, particle in a box etc.	BT 1
CO 2	**Understand** Planck's formula for black body radiation, Uncertainty principle, operator, Potential step, potential barrier etc.	BT 2
CO 3	**Apply** the topics Einstein's photoelectric equation, Compton effect, wave-particle duality, commutator of two operators, hermitian operator, tunneling effect etc.	BT 3
CO 4	**Analyze** and evaluate different problems of distinguished topics like Compton shift, Uncertainty in position, time, probability current density, orthonormal condition of wave function, expectation value, constructive and destructive operator etc.	BT 4

Title of the Paper: Nuclear & Particle Physics

Course Objectives:
To impart the understanding of subatomic particles and their properties, and emphasis is on the fundamental forces and particles, as well as composites. To familiarize with different types of nuclear reactions, the concept of accelerators and detectors.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic properties of nuclei, the concept of fundamental forces, classification of elementary particles.	**BT 1**
CO 2	**Understand** the formulations and contrasts between different nuclear models such as Liquid drop model, Fermi gas model and Shell Model, the nature and magnitude of different forces, particle interactions, families of sub- atomic particles with the different conservation laws, concept of quark model.	**BT 2**
CO 3	Apply the concepts of binding energy, nuclear models, nuclear reactions, accelerators, with scientific reasonings and critical thinking skills.	**BT 3**
CO 4	Analyze different types of nuclear reactions, Q- values, radioactivity and decay laws, energy losses due to ionizing radiations, gamma ray interactions through matter, the comparative study of a range of detectors and accelerators.	**BT 4**

Title of the Paper: Physics of non-conventional sources of energy

Course Objective:
To familiarize the student with the fundamental working principle of of biomass, wind energy, fuel cell and solar cells.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** various terms associated with different sources of renewable energy like biomass, wind, solar and fuel cell	**BT 1**
CO 2	**Understand** the geometry between Earth and Sun, working of fuel cell and solar cell	**BT 2**
CO 3	**Apply** the Sun-Earth geometry to estimate the amount of solar radiation in different location on the earth surface at different time and day of the year and calculate the potential of solar cell and finally extended to fuel cell	**BT 3**
CO 4	**Analyze** the output characteristics of solar cells and fuel cell	**BT 4**

Title of the Paper: Plasma and Space Physics

Course objectives: This course will help the students to understand, apply, analyze, and evaluate different topics of plasma and space physics like plasma oscillations, Debye shielding, ionosphere and magnetosphere, etc.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** different topics like plasma oscillations, fluid equation of motion, magnetospheric exploration, planetary and interplanetary exploration, ionospheric density etc.	**BT 1**
CO 2	**Understand** plasma parameters, Debye shielding, coronal heating, magneto-sonic and Alfven waves, etc.	**BT 2**
CO 3	**Apply** the topics Plasma confinement: single particle motion, equation of continuity, equation of state, Solar phenomena: structure of the Sun, Solar activity etc.	**BT 3**
CO 4	**Analyze and evaluate** different problems of distinguished topics like time-varying B Field, phase velocities, wave normal surfaces, solar wind formations, Ionosphere-Magnetosphere coupling etc.	**BT 4**

Title of the Paper: Basic Instrumentation Skill

Course Objective:
To acquaint the student with the measurement of some selected electrical parameters and design of basic circuits

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember various terms associated with few selected electrical devices	**BT 1**
CO 2	Understand the measurement and design procedure of the selected electrical parameters and devices	**BT 2**
CO 3	Apply the selected devices to measure voltage, current in a circuit.	**BT 3**
CO 4	Analyze the working characteristics of ammeter as a voltmeter, Wheatstone bridge	**BT 4**

Title of the Paper: General Physics Lab

Course Objective:
To familiarize with a few basic experiments of Physics and to understand the working of different devices like Post Office Box, Searle's apparatus etc.

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Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Operate different physical devices	BT 1
CO 2	Work with different mechanisms like torsional oscillation method, electrical method etc.	BT 2
CO 3	Apply different methods in experiments.	BT 3
CO 4	Analyze different experimental results with error calculations.	BT 4

Title of the Paper: Thermal Physics

Course Objectives: To familiarize the students with the fundamental principles of thermodynamics and kinetic theory by demonstrating the simplified model of real systems and to explain, analyze, and predict a variety of natural phenomena.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Remember the basic thermodynamics in relation to the study of various kinds of energy and its inter conversion.	BT 1
CO 2	Understand and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, Free energies, and partition functions.	BT 2
CO 3	Apply the concepts and laws of thermodynamics to solve problems in thermodynamic systems such as gases, heat engines and refrigerators etc.	BT 3
CO 4	Analyse the effects of temperature, pressure, volume and some other physical parameters on the working of different thermodynamics systems.	BT 4

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Programme Outcomes and Course Outcome

Bachelor of Business Administration

The Assam Royal Global University

Guwahati – 35

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UGC- LOCF at Royal School of Business:

Royal School of Business imbibes a Learning Outcome-based Curriculum Framework (LOCF) for its Under Graduate program - Bachelor of Business Administration (BBA) from the new academic session which will make learning more student centric, interactive and outcome oriented with well-defined aims, objectives and goals. The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the program level with an agenda to structure the teaching-learning process in such a way that the students obtain the much needed 21st Century skills like critical thinking, problem solving, analytical reasoning, cognitive skills, self-directed learning's among other such skills. In short, the main focus of the Program is to prepare the graduate level students in the best possible way for both, academia and employability.

The new curriculum will offer students with relevant core papers that help build their foundation in the area of management. The choice of generic electives and skill enhancement courses will enable students to pursue an area of their interest in the field of management &its allied fields . The contents of each course have been carefully designed to prepare students with knowledge and skill sets that will not only make them industry ready but also foster entrepreneurial and innovative thinking.

In order to achieve the program goals following measures would be adopted:

(i) Regulatory curriculum reform based on a Learning Outcomes-based Curriculum Framework (LOCF)
(ii) Enriching the quality of teaching and research;
(iii) Enlightening learning environment through ICT based hands-on approach to students;
(iv) Involving students in discussions, problem-solving, and out of the box thinking;
(v) Motivating the learners to understand various concepts of management and apply them in real life situations.

Program Learning Outcomes for Bachelor of Business Administration:

The term 'program' refers to the entire scheme of study followed by learners leading to a qualification. Each graduate in management shall be able to:

PO1: Disciplinary knowledge of Business Administration: Demonstrate extensive and coherent knowledge of management and its applications in real business world;

PO2: Communication Skills: Acquire various soft skills (like business communication, public speaking etc.) and leadership skills required to manage complete business situation as well as life situations;

PO3: Critical thinking and Analytical Reasoning: Analyze the business situations from different perspectives and critically assessing the situation for optimal results.

PO4: Problem solving: Assess and provide solutions to the difficult/unsolved business problems in rapidly changing environment, inculcating entrepreneurial skills.

PO5: Research-related skills: Perform investigations by defining business problems, collecting data and analysing to gain insights for decision making.

PO6: Team work: Work in teams of diverse cultures, backgrounds and cross functional areas.

PO7: Information/digital literacy: Demonstrate sufficient understanding of ICT tools in business decision making.

PO8: Self-directed learning: Develop a systematic approach to function independently in projects.

PO9: Multicultural competence: Distinguish the critical aspects in multinational business environment and adapt to achieve end results.

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PO10: Moral and ethical awareness/reasoning: Good value systems leading to high ethical and moral conduct in society at large;

PO11: Lifelong learning: Develop attitude necessary for participating in learning activities throughout life

Programme Specific Outcomes:

The outcomes and attributes described in previously are attained by students through learning acquired on completion of a program of study.

Following are the Program Specific Outcomes (PSO):

PSO 1: Understanding of business functions

PSO 2: Developing the critical and analytical thinking for managerial decision making abilities and entrepreneurial mindset

PSO3: Exposure to global perspective and become socially and ethically responsible citizens

PSO4: Interpersonal skill development

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Paper: Management Process and Organizational Behaviour

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Course Objective	Course Outcomes
To make the students understand the needs and features of human behavior in an organization, and the various aspects of the process of management in an organization.	At the end of the Course, the student should be able to: CO1: explain the different functions of management CO2: apply the concept of different leadership styles and theories CO3: apply the concept of power and politics

Paper: Marketing Management

Course Objective	Course Outcome
To impart knowledge and enhance skills to analyze business environment for marketing decision making	At the end of the Course, the student should be able to CO1: Relate the basic concepts of marketing CO2: Outline and interpret the components of marketing strategies CO3: Develop the marketing plans for small business CO4: Distinguish and compare the critical factors in marketing decision making

Paper: Business Mathematics

Course Objective	Course Outcome
To help acquire basic mathematical skills needed to understand, analyze, and solve mathematical problems encountered in business and finance	At the end of the Course, the student should be able to CO1: Relate with the basic mathematical concepts used for solving business problems CO2: Explain the use of Matrices and Calculus for finding solutions to management problems CO3: Apply the concepts for solving business problems and aid managerial decision making using Linear Programming

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Paper: IT Tools in Management-I

Course Objective	Course Outcomes
To make the students understand and learn the application of IT in the field of management.	At the end of the Course, the student should be able to CO1: Illustrate the concepts of data and information CO2: Compare the difference between various information systems CO3: Apply and analyze the concepts to solve the various management decision problems by using various tools and functions of Word, Excel and Powerpoint

Paper: Human Resource Management

Course Objective	Learning Outcomes
To familiarize the students about the different aspects of managing people in the organizations from the stage of acquisition to development and retention.	At the end of the Course, the student should be able to CO1: Demonstrate the importance and essence of Human Resources and their Effective implementation in organisations. CO2: Demonstrate a basic understanding of various tools required for the development, implementation and evaluation of Human Resource management practices in national and international contexts. CO3: Identify the key issues related to administering the human element such as motivation, compensation, appraisal, career planning and training

Paper: Accounting for Managers

Course Objectives	Learning Outcome
To enable the student to understand the basic concepts of financialaccounting & impart them with required ability to prepare books of accounts, and acquaint with methods followed and practices adopted in preparation & presentation of financial statements	At the end of the Course, the student should be able to CO1: Define and relate the concept of accounting CO2: Interpret and explain the financial statements of firms and companies. CO3: Classify the accounting information and data. CO4: Analyse the financial statement and make decision

Paper: Business Economics	
Course Objectives	**Learning Outcomes**
To enable the student to understand the laws of supply and demand and various contributing factors; various laws of production and costs; various types of market structures	At the end of the Course, the student should be able to CO1: Define the basic concepts of economics. CO2: Compare the different competitive environment. CO3: Analyse the causes and consequences of micro economic variables.

Paper: IT Tools in Management-II	
Course Objectives	**Learning Outcomes**
To enable the student to understand, and implement the various concepts in solving real life problems.	At the end of the Course, the student should be able to CO1 : Explain the basic functions of Excel. CO2 : Identify and explain the use of various functions available in Excel. CO3: Apply the different excel functions in solving various business problems.

Paper: Statistics for Management

Course Objectives	**Learning Outcome**
This paper intends to make the students understand the use of basic statistical concepts used in solving business problems. It aims to help students develop sound insights and make intelligent business decisions driven by data	At the end of the Course, the student should be able to CO1: Recall basic statistical concepts used in analysing business problems. CO2: Explain the application of central tendency measures and dispersion in analysing data. CO3: Examine problems and predict relationship between variables in different business situations.

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Paper: Financial Management

Course Objectives	Learning Outcomes
To provide understanding of financial concepts and to develop the student's ability to analyse use the results in making sound financial decisions.	On Completion of the course, the students will be able to CO1 : Explain the basic functions of Financial manager. CO2 : Apply concepts of capital structure, capital budgeting, Dividend decision and working capital management CO3 : Analyse problems in financial decision making by applying concepts learnt

Paper: Labour Laws

Course Objectives	Learning Outcomes
• To familiarize the students with the understanding of industrial and labour related laws implemented in the coutry.	On completion of the course, the student will be able: CO1: Define application of IR in organization to maintain employee relations CO2 : Demonstrate a variety of IR situations and other related matters and equip them with the necessary tools to apply the law to a given set of facts CO3: Interpret the administration of labour laws in India and thus, enhance their understanding of the functioning of labour related departments.

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Paper: Integrated Marketing Communication and Branding

Course Objectives	Learning Outcome
• To enable the students to understand the evolution, functions and principles of advertisement • To study Advertisement and Brand Management's application in an modern day competitive business environment	At the end of the Course, the student should be able to CO1: Recall and recognize the various tools of IMC and Branding concepts CO2: Summarize and interpret the process of executing an advertising campaign and brand building CO3: Analyze research process for promotion decision CO4: Examine media plan.

Paper: Production and Operations Management	Subject Code: BSA032C401 Credit Units: 4

Course Objectives	Learning Outcomes
This course aims to improve students understanding of the concepts, principles, problems, and practices of operations management for effective operations in both goods- producing and service-rendering organization.	On completion of this course, the students will be able to CO1: Demonstrate an understanding of production and operations management function in any organization. CO2: Examine the different management problems by using the tools and techniques of operations management CO3: Analyse the use of networking and scheduling techniques in the area of operations management CO4: Examine the quality issues in the production process with the help of control charts.

Adv

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Paper: Business Ethics and Sustainable Development

Course Objectives	Learning Outcomes
To impart ethical principles to the student in their personal life and in conducting business, and also give conceptual knowledge on sustainable development	At the end of the Course, the student should be able to CO1: Demonstrate a basic understanding on the concepts, needs and significance of ethics. CO2: Demonstrate critical insight to appreciate the importance of ethics in business operations CO3: Identify the issues concerning global sustainability and CSR CO4: Examine the moral standard in sustainable business

Paper: Financial Market

Course Objectives	Learning Outcomes
To introduce the Concept and working of Financial markets, Financial Instruments, Financial Institutions and Financial Services.	On completion of the course, the student will: CO1: Define the basic concepts of Indian financial system and its components CO2: Explain the interrelated linkages between financial system and economic growth CO3: Demonstrate an understanding the process of money movement between various players in financial system. CO4: Interpret the need and functions of the financial regulators; RBI and SEBI

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Paper: Talent Acquisition and Management

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Course Objectives	Learning Outcomes
• Understanding best HR practices for talent management and managing talent for teams and organizations in the both national and international contexts.	On completion of the course, the student will be able to: CO1: Explain the importance of Talent acquisition and Management in organizations. CO2: Illustrate how talent management contributes towards the measurement of the overall performance of an organization. CO3: Demonstrate the latest developments in the field of talent management.

Paper: Consumer Behaviour

Course Objectives	Learning Outcomes
The course also aims to analyse personal, socio- cultural, and environmental dimensions that influence consumer decisions making and enable the students in designing and evaluating the marketing strategies based on fundamentals of consumer buying behaviour.	After the completion of the course, the students will be able to: CO1: Recall and recognize the major influences on consumer behaviour and their inter-relationships. CO2: Interpret the internal dynamics such as personality, perception, learning, motivation and attitude to the choices consumers make CO3: Analyze the relevance of consumer behaviour theories and concepts in solving real world marketing issues.

Paper: Basics of Tally

Course Objectives	Learning Outcomes
To impart knowledge and skills for software application of financial accounting and acquaint students for practical problem solving.	After the completion of the course, the students will be able to CO1: Recall the specific tools for documenting financial transactions. CO2: Construct financial statements using Tally.

Paper: Legal Aspect of Business

Course Objectives	Learning Outcome
To provide an exposure and understanding of important business laws in India to manage the businesses smoothly & efficiently.	On completion of thecourse, the students will able to: CO 1: explain the rights and duties under various legal acts related to business CO 2: understand the consequences of applicability of various law on business situations. CO 3: develop critical thinking through the use of law cases

Paper: Entrepreneurship & Small Business Development

Course Objectives	Learning Outcome
To enable the learner to understand the various aspects of entrepreneurship such as the role of entrepreneurship in national development; identify steps in planning and organizing an entrepreneurial venture; understand the tasks and activities of an entrepreneur at different stages of the life cycle of a venture; and evaluate and solve problems involving entrepreneurship	On completion of thecourse, the students will able to: students will have theoretical knowledge and practical CO 1: outline the role of entrepreneurship in economic development. CO 2: identify the various aspects related to family business CO 3: develop and evaluate innovative business idea CO 4: understand various schemes supporting entrepreneurship.

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Paper: Indirect Tax	Subject Code: BSA032D50F1
L-T-P-C – 3-1-0-4	Credit Units: 4

Course Objectives	Learning Outcome
1. To enable students to explain the basic concepts, definitions and terms related to Goods and Service tax (GST). 2. To enable students to distinguish the difference in concept of forward charge mechanism, reverse charge mechanism, composite supply, mixed supply and various exemptions under the new Goods and Service tax regime. 3. To enable the students to analyse the persons liable for registration and the persons not required to obtain registration under the GST law.	On completion of thecourse, the students will able to: CO 1: understand and explain the taxation structure in India CO 2: explain the principle and provision of GST CO 3: interpret valuation under GST

Paper: Rural Marketing

Course Objectives	Learning Outcome
To familiarize the student with the conceptual understanding of rural marketing concept To analyse the rural markets and to understand the pricing, branding and promotional strategies used in rural marketing	On completion of the course, the students will able to: CO1: Identify the factors contributing to growth of rural markets. CO2: Estimate the demand for the rural markets and also able to distinguish the difference between rural and urban markets. CO3: Apply adaptations to the rural marketing mix, channel distribution strategies to meet the needs of rural consumers.

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Paper: Portfolio Management L-T-P-C - 3-1-0-4

Course Objectives	Learning Outcome
To understand the basics of investment and process of selection of various securities for a portfolio.	On completion of the course, the student will: CO1: **Describe** the concept of investment, risk and return. CO2: **Execute** economy industry and company analysis in selecting securities in a portfolio CO3: **Analyze** various theories related to securities selection and diversification of portfolio. CO4: **Examine** the various ways for Portfolio evaluation and revision

Paper: Compensation Management

Course Objectives	Learning Outcome
1.Recognize how pay decisions help the organization achieve a competitive advantage. 2.Analyze, integrate, and apply the knowledge to solve compensation related problems in organizations.	On completion of the course, the students will able to: CO 1: recognize how pay decisions help the organization achieve a competitive advantage CO 2: Analyze, integrate, and apply the knowledge to solve compensation related problems in organizations CO 3: demonstrate comprehension by constructing a compensation system encompassing: 1) internal consistency, 2) external competitiveness 3) employee contributions, 4) organizational benefit systems, and 5) administration issues.

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Paper: Business Research Methodology

Course Objectives	Learning Outcome
• To impart the knowledge about the concepts of Digital marketing • To enable the students to learn the various aspects of New Age Digital marketing • To help the students learn about social media marketing and online Public Relations.	On completion of thecourse, the students will able to: CO 1: Identify the importance of digital marketing for marketing success. CO 2: Interpret the importance of customer relationships across all digital channels and build better customer relationships, CO 3: Create a digital marketing plan, starting from the SWOT analysis and defining a target group, then identifying digital channels, their advantages and limitations, and finally taking into consideration the available budget.

Paper: Digital Marketing	Subject Code: BSA032D50M2
L-T-P-C - 3-1-0-4	Credit Units: 4

Course Objectives	Learning Outcome
To develop understanding of the basic framework of research process. To develop an understanding of various research designs and techniques. To understand basic concepts of research and its methodologies. To organize and conduct research in a systematic manner.	After learning this course students will be able to CO1. identify the overall process of designing a research study from its inception to its report. CO2. explain the different research approaches, techniques and strategies in the appropriate manner. CO3. demonstrate knowledge and understanding of data analysis and interpretation in relation to the research process.

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Paper: Fundamentals of International Business

Course Objectives	Learning Outcome
1.To make the student aware of the International business and various trade theories. 2.To make the student understand the International Institution framework for Trade. 3.To impart the knowledge of various elements of international trade like marketing, finance, documentation etc	On completion of thecourse, the students will able to: CO1: Identify the environments in which international business has existed in the past and how it operates in the present CO2: Explain the theory and history of international trade and the place of business in global trade are summarised CO3: Describe current international trade agreements and national trade laws and regulations

Paper: International Finance

Course Objectives	Learning Outcome
To help understand the conceptual issues in the wider field of international finance and their implications from the operational point of view.	On completion of the course, the students will able to: CO1: recognize the difference in the operations in the international and domestic financial markets. CO2. Describe the international monetary system and the foreign exchange markets. CO3. Demonstrate their understanding of the foreign exchange market and the relationships between interest rates, spot and forward rates and expected inflation rates. CO4. Analyse translation, transaction, and economic exposure to exchange rate changes.

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Paper: Organization Development and Change

Course Objectives	Learning Outcome
To expose the students to important theories and conceptual models for analyzing, understanding, managing and facilitating change and development within organizations	On completion of the course, the students will able to: CO 1: define various terms relating to organizational development & change. CO 2: identify organizational situations that would benefit from OD interventions. CO 3: understand the future of OD as a technique.

Paper: Retail Management

Course Objectives	Learning Outcome
Keeping in view the growth of the retail industry, the course has been designed to familiarize students with the basics of the retail industry and give them an overview of retail marketing practices.	On completion of the course, the students will able to: CO 1: Demonstrate an understanding of how retailers develop a retail mix to build a sustainable competitive advantage. CO 2: Explain how retailers use marketing communications to build a brand image and customer loyalty. CO 3: Understand the integration of merchandise management and supply chain strategies leading to excellent customer service

Paper: Financial Services

Course Objectives	Learning Outcome
To introduce the Concept of Financial Services and build a knowledge of various types of financial services in Indian financial system.	On completion of the course, the student will: CO1: Explain the concepts of Indian financial system and financial services. CO2: Discuss the concepts of hire Purchase and lease and its types. growth CO3: Describe the concept of venture capital financing, insurance services and credit rating. CO4: Discuss the concept of issue management and its components.

Paper: Industrial Psychology L-T-P-C -3-1-04	
Course Objectives	**Learning Outcome**
To apply psychological principles and methods to improve the overall work environment including employee performance, motivation, communication, professional satisfaction and career growth	On completion of the course, the student will: CO1: identify the importance of applying the concepts of employee attitude, behavior and motivation in organization CO2: demonstrate the understanding of knowledge required for applying the concepts of industrial psychology CO3: analyse the impact of human performance in the work place, optimizing human resources and understanding organizational climate and process

Paper: Sales & Distribution Management	
Course Objectives	**Learning Outcome**
To provide an understanding of Sales and Distribution Management, with particular emphasis on Fundamentals of sales force management and distribution management	On completion of the course, the students will able to: CO 1: Define the sales concept and also able to identify the role and responsibilities of the sales manager. Students are also able to recognize the different channels and their significance in overall sales performance. CO 2: Elaborate the elements of an effective sales force as a key component of the organization's total marketing effort. CO3: Estimate the budget and able to analyze the plan for organizing staffing & training the sales force.

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Paper: Personal & Professional Excellence	Subject Code: BS032
L-T-P-C - 1-0-2	Credit Units: 2

Course Objectives	Learning Outcome
To provide opportunity for realising one's potential through practical experience and develop professional skills for empowerment of self and others	On completion of the course, the student will: CO1: Understand role of communication in professional set up CO2: Use the necessary components required to prepare for a career in an identified occupation

Paper: Research Fundamentals I (Minor track)

Course Objectives	Learning Outcome
To make the students learn the process of research and also enable the students to interpret and analyse the findings of the research to prepare reports	At the end of the Course, the student should be able to CO1: Define and explain the various types of research and recognize the role of research in business decision making CO2: Explain the factors involved in developing an approach towards the research process CO3: Apply the research designs and distinguish the use of exploratory research in qualitative studies

Paper: Salesmanship GE LIST 2

Course Objectives	Learning Outcome
To introduced the fundamental concepts of Salesmanship and provide insights regarding various issues associated with sales like creation and growth of demand, guiding buyers and building up goodwill and reputation of sellers with the help of essential concepts of salesmanship.	At the end of the Course, the student should be able to CO1: Define and outline the various basic concept of sales management CO2: Explain and identify the functions of salesperson CO3: Apply the attributes of sales in online environment

Paper: Research Fundamentals – II (Minor Track)

Course Objectives	Learning Outcome
To make the students understand and apply the concepts of research design, sampling measurement and scaling, questionnaire design for effectively executing the research process.	At the end of the Course, the student should be able to CO1: Define the different research designs available for use in research process CO2: Identify the concepts of sampling design and techniques for executing the sampling process CO3: Apply the knowledge of measurement and scaling techniques and apply the same in designing questionnaire for surveys.

Paper: Paper: Personal Finance

Course Objectives	Learning Outcomes
To familiarize students with the financial markets, investments avenues and inducing financial sense to perform financial planning on their own	At the end of the Course, the student should be able to CO1 : Define the various investment avenues CO2: Compare the investment options on Risk, Return and other parameters CO3 : Explain the need and importance of financial planning CO4 : Explain the functions of capital markets , Mutual Funds etc

Paper: Research Fundamentals III (Minor Track) **Subject Code: BSA032G301**

L-T-P-C – 3-0-0-3 **Credit Units: 3**

Course Objectives	Learning Outcome
To equip the students with various data collection tools and techniques for conducting basic testing of hypothesis	On completion of the course, the students will able to CO 1: Define the different tools and techniques for data collection CO 2: Interpret the collected data for subsequent data analysis procedures CO 3: Demonstrate basic analysis of data using cross tabulation

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Paper: Innovation Management	Subject Code: BSA032G302
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objective:	Course Outcomes:
The objective of this course is to introduce and explore innovation management concepts, learn to manage innovation and to understand the intellectual property and patents to protect innovations.	At the end of the Course, the student should be able to CO1: Recall the innovation process and the various components involving Innovation Management. CO2: Explain the factors to achieve success and manage the uncertainties. CO3: Examine the different forms of protection from intellectual property and learn how to handle patents through its various components.

Paper: Research Fundamentals IV (Minor Track)	Subject Code: BSA032G401
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Learning Outcome
To enable the students to use different statistical tests for data analysis and interpretation and writing research reports	On completion of the course, the students will able to: CO 1: Define the fundamentals of hypothesis testing CO 2: Explain the differences between parametric and non-parametric tests CO 3: Examine and predict the relationship among studied variables

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GUWAHATI

Programme Outcomes and Course Outcome

BA-English

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Semester I

Title of the Paper: Perspectives of English Literature

Course Objectives

To equip students with knowledge of the foundational concepts of the affiliated disciplines of English literature and linguistics that will enable them to understand, appreciate, analyze, and interpret literary texts of different genres, time periods, traditions, and cultures.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**relate** the ideas of linguistics, literary terms, rhetoric, and prosody in the interpretation of literary texts.	**BT 1**
CO 2	**explain** literary texts of different genres, styles, and traditions through familiarization with a wide range of literary terms, categories and the use of figurative language.	**BT 2**
CO 3	**apply** the knowledge of language in their attempts to **compose** in different literary genres.	**BT 3**
CO 4	**develop** new interpretations of contemporary literary ideas based on an understanding of literary history.	**BT 3**

Title of the Paper: Reading Poetry 1

Course Objectives

Understanding the structures, discover the relationship and develop the capability to appreciate the work of great poets from the Elizabethan Age to the Romantics.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate to the** understanding of the works of notable poets and their works across different styles of poetry.	**BT 1**
CO 2	**Demonstrate the understanding of** poetry with the period in the context of the History of English Literature.	**BT 2**
CO 3	**Identify** the poems in the light of literary theories.	**BT 3**
CO 4	**Develop the** aspects of English poetry in contemporary approaches to poetry in general	**BT 3**

Title of the Paper: History of English Literature

Course Objective:

To apply the knowledge of History of English literature and language to establish a comprehensive understanding of the texts and contexts over the ages.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** and **classify** the key authors and texts in the history of literature in English from the Middle Ages to the present.	**BT 2**
CO 2	**Identify** major genres and literary techniques that have influenced the development of literature in English.	**BT 3**
CO 3	**Construct** the characteristics of the major periods of English literature and of the literary movements associated with each period.	**BT 3**
CO 4	**Analyse** the role of social and historical contexts in the production, reception, and transmission of literature in English	**BT 4**

Semester II

Title of the Paper: Plays and Playwrights I

Course Objectives:

Understanding the structures, discover the relationship and develop the capability to appreciate the work of great poets from the Elizabethan Age to the Romantics.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Bloom's Taxonomy Level**
CO 1	**Classify** the characteristic features of the different types of English plays	**BT 1**
CO 2	**Identify** the factors associated with the rise and development of English drama as a genre.	**BT 3**
CO 3	**Categorize** different types of plays written during the period from the Medieval Age to the Renaissance.	**BT 4**
CO 4	**Analyze** the of underlying themes in creating new interpretations.	**BT 4**

Title of the Paper: Reading Poetry II

Course Objectives

The students will be acquainted and will be able to interpret the techniques, form, and content from a varied selection of Victorian and Modern English poetry.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** Victorian and Modern English poetry.	**BT 2**
CO 2	**Organize** the constituent components and sub-genres **in** Victorian and Modern English poetry.	**BT 3**
CO 3	**Apply** their understanding of Victorian and Modern English poetry.	**BT 3**
CO 4	**Analyse** poetry from a larger expressive dimension of cultures, languages, and historic periods.	**BT 4**

Title of the Paper: Epics and Representations

Course Objectives:

To equip students with knowledge of the basic idea of the epic form.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** epics of different eras and cultures through familiarization with a wide range of literary terms, categories.	**BT 2**
CO 2	**Relate** the knowledge of basic elements of the epic form..	**BT 2**
CO 3	**Apply** the knowledge of epic forms to form interpretations	**BT 3**
CO 4	**Identify** cultural, historical and literary nuances of epics written across centuries.	**BT 3**

Semester III

Title of the Paper: Art of Fiction I

Course Objectives:

The objective of the course is to help students to trace the rise and development of the novel as a literary form and acquaint them to the different sub-genres of English fiction and the pioneers of the English novel.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Relate** the sub-genres of the English novel	**BT 2**
CO 2	**Explain** the factors associated with the rise and development of the novel as a genre.	**BT 2**
CO 3	**Apply** the understanding of different types of novels in interpreting contemporary literary works.	**BT 3**
CO 4	**Analyse** the nuances of contemporary interpretations of English fictional works.	**BT 4**

Title of the Paper: Linguistics I

Course Objectives

The objective of the course is to provide a fundamental understanding of the linguistic inquiry and the branches of linguistics in order to develop the student's ability to solve linguistic problems.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the understanding of different branches of linguistics.	**BT 2**
CO 2	**Illustrate** the linguistic structures of a language.	**BT 2**
CO 3	**Apply** the linguistic knowledge in the textual discourses and spoken discourse.	**BT 3**
CO 4	**Analyse** the core ideas in linguistic discourses.	**BT 4**

Title of the Paper: Life Narratives

Course Objectives:

To develop foundational idea of the art of autobiography in particular and the genre of life narratives in all its diversity of style, form, and thematic concerns.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Outline** the different styles, forms, thematic concerns, literary categories pertaining to life narratives.	**BT 2**
CO 2	**Identify** the life experiences as recorded in narrative form and evaluate their influence on the readers	**BT 3**
CO 3	**Apply** the narrative styles of different life narratives, particularly the form of autobiography to assess the contribution of different literary, social, cultural, and political figures in different domains across the world.	**BT 3**
CO 4	**Analyse** the factors that contribute to creating varied interpretations of life narratives.	**BT 4**

Title of the Paper: New Literatures in English

Course Objectives:

To familiarize students with the development English literature through colonialism, post-colonialism, and understand the developments in the aftermath.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the social, political and cultural developments in the era during and after post-colonialism and appreciate the broadening of English Literary canon and its scope.	**BT 2**
CO 2	**Illustrate** the characteristics of the wide range of writings from different cultures.	**BT 2**
CO 3	**Apply** and **develop** an in-depth knowledge of some of the issues of the contemporary writers in English literature, and the stylistic strategies of form and structure	**BT 3**
CO 4	**Analyse** how genre generates expectations and shapes meanings.	**BT 4**

SEMESTER IV

Title of the Paper: Plays and Playwrights II

Course Objectives:

To enhance the ability to analyze dramatic techniques and to appreciate the theatre with close readings of major literary texts from Shakespeare to Shaw.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the literary techniques in English drama.	**BT 1**
CO 2	**Compare** and **contrast** theatrical practices and social contexts till the nineteenth century.	**BT 2**
CO 3	**Identify** the changing trends and inspect the major paradigm shifts in the evolution of English drama.	**BT 3**
CO 4	**Analyse** the intricacies of performative and dialogic aspects of English drama.	**BT 4**

Title of the Paper: Literary Genre: The Short Story

Course Objectives:

To apply the knowledge and understanding of the short story genre in order to critically engage with the form and function of the various literary texts across the genres.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** the various literary texts from the short story genre.	**BT 2**
CO 2	**Explain** and **interpret** the texts and the contexts of their production.	**BT 2**
CO 3	**Identify** short stories based on their structure and meaning, using correct terminology.	**BT 3**
CO 4	**Examine** the nuances of interpreting short stories and their significance in English literature.	**BT 4**

Title of the Paper: Literature and Film: Text to Screen

Course Objectives:

The objective of the course is to enable students to understand the associations between visual and verbal codes through the study of film and literature as two separate art forms.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** the representations and deviations of the visual and verbal encoding, montage, mis-en-scene and adaptation theories	BT 2
CO 2	**Classify** the sub-genres in Film adaptation studies.	BT 3
CO 3	**Apply** the film adaptation theories in contemporary interpretations.	BT 3
CO 4	**Examine** the varied nuances of film adaptation of literary texts and construct new interpretations	BT 4

Title of the Paper: Visual Studies: Graphic Novels and Comics

Course Objectives:

To equip students with knowledge of the foundational concepts of the genre of Visual Studies to understand, appreciate, analyse, and interpret comic books and graphic novels

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the ability to make use of key concepts of visual studies to analyse, interpret and evaluate comic books and graphic novels	BT 2
CO 2	**Apply** life experiences into the visual medium	BT 3
CO 3	**Develop** the literariness of the visual medium through inspection and inference of comic books and graphic novels.	BT 3
CO 4	**Analyse** the factors that contribute to creating new interpretations in visual studies discourses.	BT 4

SEMESTER V

Title of the Paper: Art of Fiction – II (Bronte to Woolf)

Course Objectives: This course aims to introduce students to some important Victorian and Modern novelists and their major works. The course also aims to foster a deeper and more sensitive perception of these representative writers and their works.

Keywords: Victorian novel, Modern fiction, Stream of Consciousness, Gothic fiction.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	To be able to **illustrate** the rise, growth and development of English fiction during the Victorian and the Modern ages of English literature.	**BT 2**
CO 2	To be able to **identify** important Victorian and Modern novelists and the underlying ideas and themes in their major literary works.	**BT 3**
CO 3	To be able to **examine** the classifications and key characteristic features of the Victorian and the Modern novel.	**BT 4**
CO 4	To be able to **analyse and explain** the subtleties of Victorian and Modern fiction and their significance in interpreting contemporary literary discourses.	**BT 4**

Title of the Paper: Literary Theory and Criticism

Course Objectives:

This course aims to introduce students to the fundamentals of Western literary theory and criticism in order to enable them to apply these theories in the understanding and analysis of literary texts and their socio-political-historical-political-economic contexts.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and appreciate the evolution of Western literary theory and criticism since the ancient times till the modern.	**BT 2**
CO 2	**Apply** the knowledge of Western literary theories to **interpret** texts and their intersections with the context.	**BT 3**
CO 3	**Analyze** literary texts to unearth meanings embedded within.	**BT 4**

Title of the Paper: Language and Linguistics I

Course Objectives

To introduce students with the different branches of linguistics beyond structural linguistics. They will familiarise themselves with the areas where core concepts of structural linguistics are applied.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Summarize** how linguistics comes into practice in everyday life.	**BT 2**
CO 2	**Explain** how language evolved over the years.	**BT 2**
CO 3	**Construct** meaning from contextual and non-contextual linguistic information	**BT 3**
CO 4	**Determine** the process of language development in infants and children	**BT4**

Title of the Paper: Non-fictional Prose

Course Objectives

The aim of the paper is to explain the learner what non-fictional prose is and discuss its discursive facets. The paper intends to equip learner with familiarity of this literary term to enable them to distinguish other forms of writings from non-fictional prose.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Compare and contrast** fictional and non-fictional style of writing prose.	**BT 1**
CO 2	**Define** and **classify** Non-fictional writings with an **understanding** of various prose writings as developed through ages.	**BT 2 and 3**
CO 3	**Develop** and **organise** the use of prose for diverse thematic expressions.	**BT 3**
CO 4	Attain a certain degree of proficiency in the analysis and **interpretation** of non-fictional prose	**BT 4**

Title of the Paper: Literature and Gender

Course Objectives

To enable students to identify a distinct body of literature that resists and reconsiders traditional interpretations of gender, and examine the complex literary, historical, socio-cultural, political, and intersectional developments of gender through the texts of major authors and theorists.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl. No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** biologism and social constructivism, **label** key concepts such as patriarchy, performativity, and androgyny.	**BT 1**
CO 2	**Outline** an analytical and intersectional framework towards comprehending gender issues and **compare** various collective and individual identifiers which determine the subjective experiences of gender.	**BT 2**
CO 3	**Construct** a theoretical and interdisciplinary foundation to **identify** concerns of gender in the disciplines of sociology, polity, law, and psychology, enabling them to pursue further studies in similar areas.	**BT 3**
CO 4	**Analyze** literary texts in light of the theoretical lenses and **examine** the agencies of gendered power structures relating them to everyday life and realities.	**BT 4**

Title of the Paper: Postcolonial Literatures in English

Course Objectives:

This course aims to introduce students to the basics of theoretical approaches and emergent trends of postcolonial studies. This course also aims at introducing students to an overview of the corpus of postcolonial literatures in the English language.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** and **interpret** the major and emergent theoretical trends in the study of postcolonial literatures in English.	**BT 2**
CO 2	**Apply** and **utilize** the acquired knowledge, facts, and techniques to examine the different ways of reading postcolonial texts in English language and their diverse socio-political-historical contexts	**BT 3**
CO 3	**Examine** and **analyse** the postcolonial literary texts in English language texts and find evidence to support or critique the meanings embedded in the text	**BT 4**
CO 4	**Survey** the postcolonial theory landscape of the world across centuries and cultures.	**BT 4**

SEMESTER VI

Title of the Paper: American Literature

Course Objectives:

This course aims to introduce the students to American literature by exposing them to several key texts that capture the totality of the American literary experience as an outcome of its tradition, culture and politics.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Summarize** the key events in the history of American Literature	**BT 2**
CO 2	**Identify** the ideas related to the development of American literature and their significance in the existing theories.	**BT 3**
CO 3	**Examine** the literary texts and their contemporary interpretations.	**BT 4**
CO 4	**Analyse** the American literary experience from diverse perspectives while **discovering** new interpretations of existing texts	**BT 4**

Title of the Paper: Indian Writing in English

Course Objectives:

to help the students to understand the history of Indian English literature and enable them to analyse the various texts and contexts related to the Indian Writing in English.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the distinguished genre of Indian writing produced, since the inception of English education in India.	**BT 1**
CO 2	**Interpret** the noteworthy characteristics of Indian Literature from the pre-independence era to the present	**BT2**
CO 3	**Make use** of some authoritative text for better understanding of the genre	**BT 3**
CO 4	**Examine** the influence of Indian writing across various domains	**BT4**

Title of the Paper: Language and Linguistics II

Course Objectives

The objective of the course is to introduce students to a comprehensive study of the developments in the study of language and its role in everyday life. It focuses on language processing as a higher cognitive ability. It will align the fundamentals of linguistics with the advanced interdisciplinary topics of the subject for a broader perspective. Emphasis will be placed on the interplay of language with brain, mind, and society.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** how language is processed in the human brain.	**BT 2**
CO 2	**Identify** language production and language comprehension.	**BT 3**
CO 3	**List out** and **examine** the factors affecting language usage in a society.	**BT 4**
CO 4	**Analyse** how bilingualism can lead to language variation and change.	**BT4**

Title of the Paper: African Literature

Course Objectives:

This course aims to introduce students to African literature and the major trends in its writings pertaining to colonialism and its aftermath. This course also aims at helping the students acquire a critical insight and understanding of African Literature as an outcome of African culture, politics and thought.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the major themes and theoretical trends in the study of African literatures in English.	**BT 2**
CO 2	**Apply** and **develop** the acquired knowledge and techniques to explore the diverse ways of reading the allotted texts in the backdrop of their disparate socio-political-historical contexts.	**BT 3**
CO 3	**Examine** and **analyse** the literary texts and locate multiple layers if meanings embedded in the text and to support or critique the meanings	**BT 4**
CO 4	**Examine** the core understanding of postcolonial theory as a major presence in the texts in order to formulate fresh intertextual interpretation of the texts.	**BT 4**

Title of the Paper: Diaspora Studies

Course Objectives:

This course introduces students to the Diaspora Studies as a new interdisciplinary area that has emerged in Humanities and Social Sciences dealing with the study of migration and its cultural, literary, social, demographic, political, economic impact and international relations.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Know** the meaning of diasporic literature and its distinct characters	**BT 2**
CO 2	**Read** and **understand** some of the representative diasporic literary pieces	**BT 3**
CO 3	**Understand** how formulaic elements create the ideal world without limitations or uncertainties in readers' imagination.	**BT 4**
CO 4	**Examine** the literary and aesthetic merits of diasporic fiction and poetry	**BT 4**

Title of the Paper: Aesthetics of Representation

Course Objectives:

This course aims to introduce students to major trends in Eastern and Western aesthetics. This course aims at helping the students acquire a critical insight and understanding of embedded aesthetical perception and knowledge and develop and overall sense of refinement in taste.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and **interpret** issues surrounding the creation, interpretation, design, and ultimate appreciation of works of art, music and culture.	**BT 2**
CO 2	**Develop** and **apply a** refined perception and individual sensitivity to the aesthetics and experience of everyday life.	**BT 3**
CO 3	**Examine** and **analyse** the literary texts and locate multiple layers if aesthetical meanings embedded in the text and to support or critique the meanings	**BT 4**
CO 4	**Examine** ones subjective response to the close links between aesthetics, communication and ethics.	**BT 4**

Title of the Paper: Literature of North East India

Course Objectives:

To offer a basic idea of literature of North East India in both its oral and written dimensions in addition to offering an understanding of the historical and cultural background of the region.

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the concept of North- East India as a cartographical and cultural category.	**BT 1**
CO 2	**Classify, compare** and **contrast** the acquired knowledge, facts, and information pertaining to the diverse literatures of North East India.	**BT 2**
CO 3	**Identify** the literary texts that reflect the diversity of ethnicity, language, culture and history of North East India	**BT 3**
CO 4	**Examine** the dynamics of linguistic, ethnic, cultural and religious diversity in the literatures that emerge of North East India.	**BT 4**

Title of the Paper: Popular Literature

Course Objectives:

Popular literature has a distinctive structure and theme compared to other literary products. This course aims to explain the background of the emergence of popular literature as a part of literary products related to ideology and popular culture in the order of changes in the construction of global society.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Know** the meaning of Popular Literature and its distinct characters	**BT 2**
CO 2	**Read** and understand some of the representative popular literary pieces	**BT 3**
CO 3	**Understand** how formulaic elements create the ideal world without limitations or uncertainties in readers' imagination.	**BT 4**
CO 4	**Probe** into the literary and aesthetic merits of popular fictions.	**BT 4**

THE ASSAM
ROYAL GLOBAL UNIVERSITY
GUWAHATI

Programme Outcomes and Course Outcome

BA-History

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd : 2018

Anuradha Das

Director, IQAC
The Assam Royal Global University

1.1 Nature and Extent of the B. A. History (Hons.) Programme

A bachelor's degree in History with Research is a 3 years degree course which is divided into 6 semesters as under.

Sl. No.	Year	Credits
1	1st Semester	24
2	2nd Semester	24
3	3rd Semester	24
4	4th Semester	24
5	5th Semester	26
6	6th Semester	26
Total		148

A student pursuing 3 years undergraduate programme shall be awarded an appropriate Degree in that discipline on completion of the 6th Semester if he/she secures 148 Credits.

Bachelor's Degree (Hons.) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire in order to access professional avenues or move to higher education at the postgraduate level.

Programme Learning Outcomes in B.A. (Hons.) History

Programme Outcomes: Students enrolled in the program complete a curriculum that exposes and trains them in a range of essential skills and abilities. They will have the opportunity to pursue and achieve the following outcomes:

PO 1 Disciplinary Knowledge: Gain workable knowledge of historical and historiographical trends in Indian history as well as the history of global societies and cultures.

PO 2 Comparative Knowledge: To interpret historical narratives by deploying historical facts as critical corroborative paradigms.

PO 3 Inferential Capacity: To develop a scholastic sense of history and a deductive as well as inductive approach to the discernment of historical patterns including comparative studies that draw heavily upon history.

PO 4 Interdisciplinary Introduction to Archaeology: To enable absorption of students in the field of Archaeology which is in high demand both in India and abroad.

PO 5 Holistic Cognitive Development: To evolve a critical understanding of methods and theories within the social sciences with a view to engender a humanist and sensitized approach to social issues.

PO 6 Skill Development: To equip oneself with the paraphernalia of digital resources and infrastructure so as to gain an edge in an information driven world.

PO 7 Socio-political Awareness: To undertake social responsibilities as leaders in challenging environments through application of acquired knowledge.

PO 8 Life-long Learning: To appreciate the unique historical and diverse cultural ethos of the Nation and to engender a sense of lasting intellectual curiosity and a desire for life-long learning.

Programme Specific Outcomes (PSOs)

PSO 1: To provide students with a creative and independent environment to achieve the acquisition of the fundamentals of the 'Historian's Craft'.

PSO 2: To awaken a sense of interdisciplinary curiosity and acquaint our students with the latest development of contemporary scholarship and research in India and abroad.

PSO 3: To instill a deep sense of belongingness and respect for the national ethos.

Level: Semester – I

Course: C-1

Title of the Paper: History, Heritage, and Tourism

Course Objective:
The course will familiarize students with the history and development of tourism with special reference to the North-east of India.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Relate the social and cultural histories of India, in addition to the knowledge of Indian art and architecture, crafts, painting and dance forms.	**BT 1**
CO 2	Explain literary texts of different genres, styles, and traditions through familiarization with a wide range of literary terms, categories and the use of figurative language.	**BT 2**
CO 3	Identify what is heritage and interpret its resource for tourists as well as local communities.	**BT 3**
CO 4	Assume professional skills facilitating job prospects in various fields like public administration, social work, history, and in the tourism industry.	**BT 4**

Course: C-2

Title of the Paper: History of Ancient India

Course Objectives:
To introduce students to important issues related to reconstructing Ancient Indian History including the phase of pre-historic hunter-gatherers and initial settlers.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Find out the advent of food production and to define the transition from nomadic to sedentary settlement patterns.	**BT 1**
CO 2	To illustrate an understanding of the sources, tools, and various interpretations in Indian history, from the Harappan civilization till *c.* 300 BCE	**BT 2**
CO 3	Apply the knowledge acquired from the course to analyze the changes in society, economy, polity and culture of the ancient Indian sub-continent.	**BT 3**

Course: C-3

Title of the Paper: History of China (1838-1949)

Course Objective:
To sensitize the students to the history of China and its importance in World history.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the process of opening up of China for the exploitation of the western colonial powers.	**BT 1**
CO 2	Explain the causes for the emergence of different protest movements in China to oppose the colonial exploitation, the rise of nationalism in early 20th CE China, China's participation in the World War I and II, the outbreak of the Chinese Civil War and the establishment of Communist Government in China.	**BT 2**
CO 3	Develop a better understanding of China and its policy imperatives in connection to geo-political issues.	**BT 3**

Course: S-1

Title of the Paper: Introduction to Museum and Museology

Course Objectives:
The course seeks to introduce students with the historical evolution of museums from global as well as Indian perspective and the use of museums thereof. The course will familiarize students with the necessity of establishing museums and their informative and pedagogical inputs for an informed public opinion.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the concept of museums, it's historical evolution and aspects of heritage conservation.	**BT 1**
CO 2	Interpret the conceptual and methodological knowledge about the role of museums in the context of education and research	**BT 2**
CO 3	Apply the knowledge acquired from the course in Museum-management and related activities pertaining to curative, preservative and display of artefacts.	**BT 3**

Adv

AECC - 1 (1ST SEMESTER)

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

CO1. Demonstrate Communication process, verbal, and non-verbal communication

CO2. Understand the skill of listening processes

CO3. Develop a life skill on oral group communication- group discussion leadership skills, team management.

CO4. Make use of basic idea of language styles – oral and written communication.

AECC – 2 (1st Semester)

AECC-2/Subject Name: Behavioural Science – I

Course objectives:

To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

CO1. Understand self-identity and identity crisis

CO2. Demonstrate self-esteem.

CO3. Develop in depth knowledge of foundation of individual behaviour.

CO4. Develop a life skill on Time management

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Course: G-1

Title of the Paper: Social Formations and Cultural Patterns of the Ancient World

Course objective:

To introduce students to the evolution of humankind, Palaeolithic and Mesolithic cultures and also the phase of Bronze Age civilizations and the Nomadic groups of Central and West Asia up to the classical period of Greece.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Relate to the evolution of Humankind and Stone Age cultures.	**BT 1**
CO 2	Infer the significance of beginning of food production and the development of Bronze Age cultures subsequently.	**BT 2**
CO 3	Develop skills to understand human history from a comparative standpoint.	**BT 3**

Course: G-2

Title of the Paper: History of North-East India

Course Objectives:

To familiarize the students with the basic tenets of history of Northeast India during the colonial period including the advent of the missionaries and penetration of colonial modernity.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the British annexation and consolidation policies in Northeast India.	**BT 1**
CO 2	Interpret the major trends of political, social, and economic developments in Northeast India under the British.	**BT 2**
CO 3	Make use of knowledge of the colonial period vis-à-vis advent of modernity to assess the current issues of Northeast India.	**BT 3**
CO 4	Compare the changes in indigenous and colonial societies for a better historical insight of society and economy under the colonial rulers.	**BT 4**

Level: Semester - II

Course: C-4

Title of the Paper: Introduction to Public History

Course Objective:

The objective of this course is to provide a detailed understanding of public history and the know-how regarding its application.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the theories and find the sources of public history	**BT 1**
CO 2	Demonstrate contemporary practices in public history, pertinent to culture and tourism.	**BT 2**
CO 3	Apply the knowledge acquired through this course to practice public history writing/construction through new forms like podcasts, YouTube videos, installations, etc	**BT 3**

Course: C-5

Title of the Paper: History of Early Medieval India

Course Objective:

Introduce students to the basic historical concepts and facts of Early Medieval India with special reference to emergence of Indian feudalism and the reforms brought about by Sufi-Bhakti movement and the syncretic culture introduced by them.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall Early Medieval India in terms of its polity, society, and economy.	**BT 1**
CO 2	Demonstrate an understanding of the monotheistic movements in Early Medieval India.	**BT 2**
CO 3	Apply knowledge acquired from this paper in dealing with complex issues of human society like inter-mixing of communities, fusion of different cultural traits etc.	**BT 3**

Course: C-6

Title of the Paper: History of Japan (1853-1945)

Course Objective:

To introduce students to the first Asian imperial power Japan, its internal structure of governance and society and its role in World politics in the 19th and 20th centuries.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the historical process behind the rise of Japan as a modern and imperial power.	**BT 1**
CO 2	Illustrate the role played by Japan in the World War I and II.	**BT 2**
CO 3	Make use of the knowledge acquired through this course in analyzing the influence of Japan in World politics with special reference to Asia.	**BT 3**

Course: S-2

Title of the Paper: Museology: Theory and Practice

Course objective:

The course aims to acquaint students with the fundamentals of the making of a museum and the role and function of the "museum," from its historical beginning to the present.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the conceptual and functional frameworks regarding working of museums.	**BT 1**
CO 2	Explain the important role that museums can play in the context of education and research.	**BT 2**
CO 3	Make use of the knowledge gained from this course in opening up professional prospects to be employed as conservation specialists, curators, design consultant, archivists, specialists on the field of public history etc.	**BT 3**

AECC-3/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes: On completion of this course students will be expected to -

1. Demonstrate speaking skill.
2. Develop a life skill on conversation.
3. Develop the skill of public speaking.

AECC-4 (2nd Semester)

AECC-4/Subject Name: Behavioural Science - II

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

1. Understand culture and personality
2. Understand Value.
3. Demonstrate leadership.
4. Develop a life skill on motivation

Course: G-3

Title of the Paper: Social Formations and Cultural Patterns of the Medieval World

Course Objectives:

To introduce students to Medieval Europe by tracing its development through the rise of the Roman republic and its transformation into an Empire. The course will provide a detailed overview of the socio-cultural dimension of the medieval period by tracing the rise of Islam and associated developments.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the various aspects of Roman Republic, the Principate and Empire.	**BT 1**
CO 2	Explain Islam and its spread into the Central Asian Highlands in detail and its subsequent developments.	**BT 2**
CO 3	Utilize the conceptual knowledge of slavery, republic, urbanization, feudalism etc. in assessing issues in contemporary politics and the socio-economic scenario.	**BT 3**

AECC – 3 (2ND SEMESTER)

Level: All Semesters

Course: G-4

Title of the Paper: Introduction to Archaeology: An Insight into India's Past

Course Objective:

To introduce students with the basic concepts of archaeology by giving them broad overview of significant trends.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the discipline of archaeology and its multi-dimensional functions and uses.	**BT 1**
CO 2	Classify the characteristics of archaeology and compare its relationship with history.	**BT 2**
CO 3	Apply the knowledge acquired from this course in unfolding of human past particularly India by becoming part of different archaeological teams. Also, it will give the students an impetus to do full-fledged courses in archaeology.	**BT 3**

Level: Semester - III

Course: C-7

Title of the Paper: History of India: Mughal Period

Course Objective:

To conduct, a source base recontextualization of the History of the Mughals in India with an aim to provide a solid foundation to our students to develop their own understanding of the structural complexities and socio-cultural nuances of medieval India.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Find the various sources, both literary and archaeological pertaining to the Mughal period.	**BT 1**
CO 2	To explain the formation, expansion, and development of the Mughal Empire in India along with the policies adopted by them towards the Rajputs and Marathas.	**BT 2**
CO 3	To identify the various socio-economic, cultural, religious and administrative trends operating during the Mughal period.	**BT 3**

Course: C-8

Title of the Paper: Rise of Modern West I

Course Objectives:

The students will be expected to know the development of modern Europe in the context of the rise of capitalism, early colonialization, and foundation of the colonial empires.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the important events in European History such as the decline of feudalism and the early colonial ventures and the beginning of capitalism.	BT 1
CO 2	Illustrate the underlying socio-religious and cultural discourses such as Renaissance, Reformation, Counter-Reformation that fueled such developments.	BT 2
CO 3	Apply the knowledge of the course in certain professional fields such as historical tourism.	BT 3
CO 4	Analyze the current trends in world politics and international relations.	BT 4

Course: D-1

Title of the Paper: History of Delhi Sultanate (c. 1206 CE- c. 1526 CE)

Course Objective:

To learn the foundation of the Delhi Sultanate and the Sultanate administration and to develop a keen sense of understanding in the growth of Bhakti and Sufi movements along with other socio-cultural aspects.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the foundation of the Delhi Sultanate and the changing socio-cultural patterns in art and architecture.	BT 1
CO 2	Explain socio-economic and religious conditions under the Delhi Sultanate.	BT 2
CO 3	Identify the changing dynamics of the contemporary world with cues from the knowledge of the multi-cultural developments in Medieval India.	BT 3

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Course: S-3

Title of the Paper: Basic Writing Skills

Course Objectives:
This course helps students develop competence in written communication by practicing writing skills. Students shall learn how to recognize and use sentence patterns and to write coherent paragraphs containing a topic sentence, idea development, and a strong conclusion.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	List the idea generation strategies.	**BT 1**
CO 2	Illustrate complete paragraphs, avoiding fragments and run-ons and effectively use capital letters, quotation marks and end punctuations.	**BT 2**
CO 3	Build sentences that support the topic with facts, details, and examples (support) and link support sentences using appropriate order (time, space, Importance).	**BT 3**
CO 4	Analyze one's writing challenges and develop strategies to address those challenges (grammar log, revision checklist, etc).	**BT 4**

Course: G-5

Title of the Paper: History of Medieval India

Course Objectives:
To introduce students to the multidimensional nature of the history of medieval India with a view to enhancing their capacity to recognize and interpret institutional/cultural processes and thereby draw out their ability to negotiate the complex socio-political structure of the contemporary world.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the world of medieval politics in India, capturing and contextualizing its nuances.	**BT 1**
CO 2	Explain the multicultural exchanges and the multi-religious interactions of medieval world, its impact as it is felt in the domain of popular culture, high culture and contemporary ethos.	**BT 2**
CO 3	Identify relational knowledge of cultural manifestations of the Empire and its structure of authority.	**BT 3**

Level: Semester – All Semesters

Course: G-6

Title of the Paper: History of North-East India

Course Objectives:

To familiarize the students with the basic tenets of the history of the Northeast India during the colonial period including the advent of the missionaries and penetration of colonial modernity.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the British annexation and consolidation policies in Northeast India.	**BT 1**
CO 2	Interpret the major trends of political, social, and economic developments in Northeast India under the British.	**BT 2**
CO 3	Make use of knowledge of the colonial period vis-à-vis advent of modernity to assess the current issues of Northeast	**BT 3**
CO 4	Compare the changes in indigenous and colonial societies for a better historical insight of society and economy under	**BT 4**

Level: Semester – IV

Course: C-9

Title of the Paper: Socio-Religious History of Modern India

Course Objective:

The course aims at enlarging and building upon the knowledge base of students by introducing them to the socio-religious history of Modern India in the 19th and the 20th century and thereby aims to generate critical thought among scholars by way of a curated survey of the historiographical literature of the socio-religious movement in India. It is expected to engender the capacity to recognize, reassess and work upon the fundamental questions of contemporary times.

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Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	To list the details of the contested history of the socio-religious movement in India.	**BT 1**
CO 2	To spell the interpretative understanding of the motivations, milieu, and legacy of these movements in contemporaneous times.	**BT 2**
CO 3	Build a strong framework to assess the historical impact of the formative phase of mass movements.	**BT 3**

Title of the Paper: Rise of Modern West II

Course objectives:

The students will be expected to analyze the different socio-economic and political forces like capitalism, colonialism and the rise of European imperialism behind the evolution of modern Europe during the 17th and the 18th centuries.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define post-feudal Europe in the context of the rise of capitalism.	**BT 1**
CO 2	Infer the link between social, economic, and political developments of the modern European continent and the world at large.	**BT 2**
CO 3	Utilize the knowledge of the course to rationalize the current developments in contemporary world history.	**BT 3**

Course: D-2

Title of the Paper: Introduction to Archaeology

Course objectives:

To introduce archaeology in historical studies in order to provide knowledge of sources and their interpretation for the reconstruction of history.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the primary aspects of archaeology.	**BT 1**
CO 2	Illustrate the different issues of ancient history both in the context of India and other regions of the world, where archaeology is an essential methodology.	**BT 2**
CO 3	Choose archaeological sites.	**BT 3**
CO 4	Take part in field archaeology and rebuild the lifeways of both literate and pre-literate societies.	**BT 4**

Course: S-3

Title of the Paper: Basic Writing Skills

Course Objectives:

This course helps students develop competence in written communication by practicing writing skills. Students shall learn how to recognize and use sentence patterns and to write coherent paragraphs containing a topic sentence, idea development, and a strong conclusion.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	List the idea generation strategies.	**BT 1**
CO 2	Illustrate complete paragraphs, avoiding fragments and run-ons and effectively use capital letters, quotation marks and end punctuations.	**BT 2**
CO 3	Build sentences that support the topic with facts, details, and examples (support) and link support sentences using appropriate order (time, space, Importance).	**BT 3**
CO 4	Analyze one's writing challenges and develop strategies to address those challenges (grammar log, revision checklist, etc).	**BT 4**

Course: G-7

Title of the Paper: History of Modern India from 1757 to the Modern Times.

Course Objective:

The course aims at orienting students towards an understanding and appreciation of the contested history of this period. It further aims at generating the capacity to evaluate the legacy of Indian Modernity in the post-colonial world.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Understand the history of colonial expansion and resistance against it.	**BT 1**
CO 2	Critically interpret the political, social and economic dimension of the national movement.	**BT 2**
CO 3	Application of debates and discourses regarding India's colonial past in relation to the experience of modern India.	**BT 3**

Level: All Semesters

Course: G-8

Title of the Paper: Introduction to Archaeology: An Insight into India's Past

Course Objective:

To introduce students to the basic concepts of archaeology by giving them a broad overview of significant trends

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the discipline of archaeology and its multi-dimensional functions and uses.	**BT 1**
CO 2	Classify the characteristics of archaeology and compare its relationship with history.	**BT 2**
CO 3	Apply the knowledge acquired from this course in unfolding of human past particularly India by becoming part of different archaeological teams. Also, it will give the students an impetus to do full-fledged courses in archaeology.	**BT 3**

Title of the Paper: History of Modern Europe I

Course objective:

The students will be expected to analyze the different socio-economic and political forces like capitalism, liberalism and the rise of nationalism in modern Europe during the 18th and 19th centuries.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the genesis of liberal and nationalist thought.	**BT 1**
CO 2	Infer the link between social, economic, and political developments of modern Europe, with respect to revolutions and revolutionary thought.	**BT 2**
CO 3	Utilize the knowledge of the course to rationalize the current developments in contemporary world history.	**BT 3**

Level: Semester – V

Course: C-12

Title of the Paper: Politics and Authority in Medieval India

Course Objective:

To introduce students to the history of medieval India from an institutional perspective. The paper aims at providing insight into the structural experience of power politics within the empires and kingdoms of northern and southern India.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Relate the process of state-formation and institutional developments in the Mughal empire.	**BT 1**
CO 2	Explain the intersection of institutions of state organization such as Mansab-Jagir, Zabti, Dahsala, etc with the configuration of power within medieval states.	**BT 2**
CO 3	Develop a nuanced understanding of power politics in Mughal India by way of identifying its relation with religion, culture and art.	**BT 3**

Course: D-3

Title of the Paper: History of North East India

Course Objectives:

To familiarize the students with the basic tenets of history of Northeast India during the colonial period including the advent of the missionaries and penetration of colonial modernity.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the British annexation and consolidation policies in Northeast India.	**BT 1**
CO 2	Interpret the major trends of political, social, and economic developments in Northeast India under the British.	**BT 2**
CO 3	Make use of knowledge of the colonial period vis-à-vis advent of modernity to assess the current issues of Northeast India.	**BT 3**
CO 4	Compare the changes in indigenous and colonial societies for a better historical insight of society and economy under the colonial rulers.	**BT 4**

Course: D-4

Title of the Paper: History of United States of America I

Course Objectives:

The course will cover the history of the United States from the beginning of 1492 to 1865, taking into account the various historical forces that had shaped the creation of the American Republic. More importantly, this course's primary focus is not only the average, "ordinary American", but the majority of America's population including American Indians, African Americans, women, poor farmers, factory laborers, etc.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the significant developments in American history over a defined span of time, roughly the 1492 to 1865.	**BT 1**
CO 2	Interpret historical development through knowledge of institutional, social, cultural, and political evolution and change	**BT 2**
CO 3	Students will be able to interpret and evaluate the acceptability of historical evidence.	**BT 3**
CO 4	Compare the major social, political, economic, and cultural events and it how those events affected the development of American	**BT 4**

Level: Semester – VI

Course: C-13

Title of the Paper: History of Modern Europe II

Course Objective:

The students will be expected to analyze the different socio-economic and political forces like Socialism, Communism and Fascism modern Europe during the 19th and 20th centuries. At the same time, it will apprise students to pivotal historical events like the WW I and WW II.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the impact of nationalist, socialist and revolutionary thought.	**BT 1**
CO 2	Infer the link between social, economic, and political developments of 20th century Europe with respect to ideologies like Communism and Fascism.	**BT 2**
CO 3	Utilize the knowledge of the course to rationalize the current developments in contemporary world history.	**BT 3**

Course: C-14

Title of the Paper: State, Power and Resistance in Modern India

Course Objective:

To introduce students to the history of India's colonization from the perspective of ideologies and structures. The paper aims at illustrating the history of modern India in the light of institutions such as land revenue systems, colonial legal framework, education etc. It also aims at developing a nuanced understanding of alternative currents in the national movement in colonial India.

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Course Outcomes:

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Relate the history of colonization of India with an emphasis on colonial ideology and institutions.	**BT 1**
CO 2	Explain the complex history of 18th century India and the evolution of colonial systems of rule viz land revenue, law, army, education.	**BT 2**
CO 3	Develop a nuanced understanding of the alternative currents in the national movement.	**BT 3**
CO 4	Analyze the historiographical literature on the 18th century to arrive at a comparative understanding of the contours of historical research in this arena.	**BT 4**

Course: D-5

Title of the Paper: History of South-East Asia in the 20th Century

Course Objective:

Southeast Asia is a region containing an incredible diversity of states, cultures, beliefs, societies, and peoples. This course will serve as an introduction to the long history of this diverse region, and the impact of that history in present times. The paper examines the spread of colonialism and its impact on socio-economic sphere from as well as growth of nation states after World War II.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Relate to the complex history of South East Asia in the 20th century CE.	**BT 1**
CO 2	Explain the processes involve in the colonization of South East Asian nations and the rise of national resistance.	**BT 2**
CO 3	Utilize the knowledge of the course to rationalize the current developments in contemporary South East Asia	**BT 3**

Title of the Paper: History of the United States of America II

Course Objectives:

The course will cover the history of the United States from the post-Civil War era (roughly the 1860s) to the Reagan era. The course will introduce major social, political, economic, and cultural events and it will address how those events affected the development of American polity and society. Particular attention will also be devoted to the role of popular culture and to the emergence of the United States as a world power.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Recall the significant developments in American history from 1865 till the cold war.	**BT 1**
CO 2	Interpret significant events that contributed to the development of the United States of America.	**BT 2**
CO 3	Students will be able to evaluate the acceptability of historical evidence from the civil war till the cold war.	**BT 3**
CO 4	Utilize the knowledge of major social, political, economic, and cultural events to navigate contemporary policies of United States of America.	**BT 4**

Course: D-3

Title of the Paper: Economic History of Colonial India

Course Objective:

To sensitize the students to the various economic changes introduced by the colonial rulers in India and its impact.

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Define the process of contestation among different European powers and the rise of a colonial economy in India.	**BT 1**
CO 2	Explain the causes of deindustrialization and its impact on India economy, the concept of drain of wealth, the various colonial land revenue policies and its impact on the Indians.	**BT 2**
CO 3	Develop a better understanding of the colonial trade and commercial policies along with the advent of modern industries and its far-reaching impact on modern Indian economy.	**BT 3**

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GUWAHATI

Programme Outcomes and Course Outcome

B.Des Fashion Design

The Assam Royal Global University
Guwahati – 35

The Assam Royal Global University IQAC Estd 2018

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1.1 Nature and Extent of bachelor's degree Programme in Fashion Design

A bachelor's of Design Degree in Fashion Design (Specialization with Research) is a 4 years degree course which is divided into 8 semesters as under.

Sl. No.	Year	Mandatory Credits to be Secured for the Award
1	1st	48
2	2nd	48
3	3rd	52
4	4th	57
Total Credits		**180**

A student pursuing 4 years undergraduate programme with research in a specific discipline shall be awarded an appropriate Degree in that discipline on completion of 8th Semester if he/she secures 180 Credits. Similarly, for certificate, diploma and degree, a student needs to fulfil the associated credits. An illustration of credits requirements in relation to the type of award is illustrated below:

Bachelor's Degree (Specialization with Research) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

Bachelor's Degree (Specialization with Research) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, B.Des. (Specialization with Research) Course in Fashion Design aims to equip students to qualify for joining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

Fashion Design program is inclusive and broad based even as it carries imprints of specialised area of skill studies. In this program , student research is given importance to , particularly in the 3rd year of B.Des in Fashion Design program. The objective of this syllabus is to revisit traditional expectation of teaching and learning fashion design by centre - staging outcomes that are demonstrable through the following key attributes: Understanding , Use communication, Expansion , and application of Subject knowledge with a clear awareness and understanding of one's location in global environment .

1.2 Programme Learning Outcomes relating to B.Des Degree programme in Fashion design:

Students graduating with the degree B.Des (Fashion Design)will be able to achieve the following-

PO1: Disciplinary knowledge of Fashion design and technology:

The student will recognise and Gain knowledge of the fundamental principles of fashion, apparel, and design.

PO2: Understanding:

The student will inculcate knowledge on the fashion process from conceptualisation to technical expertise.

PO3: Communication Skill :

The student will be capable to foster a spirit of zeal in learning and communicating fashion towards professional development.

PO4: Situational and creative thinking:

The students will demonstrate the creative task based on t the observation and sketch it into reality and develop theme based ensembles.

PO5: Problem Solving:

The students will examine and illustrate the selective area where the problems need to be sorted with well research & explore.

PO6: Logical Analysis:

The students will be able to quickly solve the problem by differentiating or identifying the problem such as familiarising with upcoming trends and practices in fashion and apparel sectors.

PO7: Manufacturing and Digital literacy :

The student will apply knowledge and skills in the use of basic tools, techniques and processes sufficient to produce work from specification to finished products and Use CAD applications in par with the industry demands.

PO8: Project development Techniques :

The student will outline and examine ascertain relevant source to find out substantive explanation and work on conceptualised fashion related projects.

PO9: Team work:

The student will participate and show efforts effectively in both classroom and team to complete projects within given deadlines. Develop entreprencurial spirits through start-ups to function to promote their design vision through creative and innovative work.

PO10 : Core Value :

The students will have the ability to interrogate one's own ethical values, and to be aware of ethical issues, misrepresentation of data or committing plagiarism and appreciating environmental and sustainability issues.

PO11: Life- Long Learning:

The students will have the ability to read values inherited in creativity and religion, and spirituality, as also structures of power.

1.3 B.Des Degree Fashion Design Specific Outcomes:

Students who successfully complete the fashion designing & apparel making program will be able to:

PSO1: Apply comprehensive abilities in creating and presenting product for entry-level positions in the fashion industry;

PSO2: Work well together as emerging team players and innovative design thinkers;

PSO3: Understand and implement new technologies relative to design development, material choices, and the manufacture and distribution of fashion;

PSO4: Adapt their inspired knowledge and abilities to ongoing changes in global fashion and related creative industries.

- Seminars and conferences
- Extra-curricular activities like cultural activities, community outreach programmes etc.
- Field trip, excursions, study tour, interacting with eminent authors, etc.

SYLLABUS (5thSEMESTER)

Course: C-1

Title of the Paper: Draping-II

Course Objective:

The objectives of the subject is to enhance the skill of students by developing their ideas into real garments by incorporating an advanced form of draping directly on a dress form to get the required style, shape and fit.

Course Outcome:

On successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Understand** about different types of collars and different types of neck designs used in Draping.	**BT Level 1**
CO2	**To understand** the different types of finishing techniques used in garment to give it better fitting	**BT level 2 & 3**
CO3	**Create** different kind of collars and different neck designs	**BT Level 4**
CO4	**Create** garments using different finishing techniques, neck variation and sleeves.	**BT Level 4**

Course: C-2

Title of the Paper: Pattern Making &Garment Construction-II

Course Objective:

The objective of the subject is to learn to make the pattern for different variety of women's wear according to standard body measurements.

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	To **Understand** the about the different types of darts.	**BT Level 1**
CO2	**Compare and recognize** the different loose cloth vs fitting cloth	**BT level 1 & 2**
CO3	**Develop** patterns made as per the design	**BT Level 3**
CO4	**Develop** garments with the help of patterns developed	**BT Level 3**

Department Specific Elective (DSE)

Title of the paper: Study of Apparel Industry & Accessory Design

Course Objective:

The objective of the subject is to develop understanding with an in-depth learning about the apparel and the accessory industry, its various departments and functions that play an important role. The students will learn the basics about jewelry design, explore with products like bags, shoes, belts and scarves and also to study the present trends in the market and then interpret it and create their own designs

Course Outcome:

On successful Completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Define and identify manufacturing process of apparel and accessory industry	**BT Level 1**
CO2	Practice the knowledge of apparel and accessory industry and develop designs, concepts and its process	**BT level 2**
CO3	Develop prototype and learn the process of designing a full range of accessories. Analysis the role of an apparel merchandiser and the importance of maintaining quality parameters in the apparel industry.	**BT Level 3**
CO4	Establish collection of accessories and Illustrate sketches of the final products which will later be the part of their portfolio which can be presented while applying for jobs in future aspects.	**BT Level 4 and BT Level 3**

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Department Specific Elective (DSE)

Title of the paper: Fashion Brand Management

Course Objective:

The objective of the subject is to develop and enhance the management skills of the students by teaching them the importance of branding & marketing communications.

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	.To **Define** the basic concepts of Brand Management.	**BT Level 1**
CO2	To **Gather** different communication programs for brands	**BT level 2**
CO3	.To **compare** the different brand performances	**BT Level 3**
CO4	To **develop** ideas to create their own brand	**BT Level 4 and BT Level 3**

Title of the paper: CAD: Pattern Grading & Marker Planning

Course Objective:

The objectives of this subject is to develop understanding of application of computers in patternmaking. They will learn the software and thus develop an understanding of howto simplify and accelerate pattern design.

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	To learn REACH CAD, a premier pattern and marker planning software.	**BT Level 1**
CO2	They will develop an understanding of how to enable the apparel production sector reduce product development time and reduce consumptions of fabric.	**BT level 2**
CO3	They will learn to do design analysis and exploration ofconcept.	**BT Level 3**
CO4	They will learn to explore with concept of developing patterns digitally	**BT Level 4 and BT Level 3**

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Internship

Title of the paper: Internship Documentation/Summer Project

Course Objective:

The objective of the subject is to introduce students to the industry and understanding of designer's role & responsibility in this context. It is aimed at providing the fashion design students with a professional design experience by familiarizing them with a working knowledge of the functioning of the apparel industry and the relationship between design and production.

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	To **Understand** how the functioning of Fashion Industries	**BT Level 1**
CO2	**Use** of ideas to design according to the market demands	**BT level 2**
CO3	**Classification** of different patterns according to different human sizes	**BT Level 3**
CO4	**Construct** different patterns according to different sizes.	**BT Level 4 and BT Level 3**

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SYLLABUS (6thSEMESTER)

Course: C-1

Title of the Paper: Couture Draping

Course Objective:

The objectives of the subject is to enhance the skill of students by developing their ideas into real garments by incorporating an advanced form of draping directly on a dress form to get the required style, shape and fit

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	To **Learn** the advanced level of Draping	**BT Level 1**
CO2	**Identifying** the correct method to used for right design	**BT level 2**
CO3	To **apply** complex and modern techniques to construct gowns	**BT Level 3**
CO4	**Create** complex design using the technique of draping	**BT Level 4 & 5**

Course: C-2

Title of the Paper: Pattern Making & Garment Construction III

Course Objective:

The objectives of the subject is to teach the students the pattern making and garment construction of formal outer wear for both women's wear and menswear on actual fabric. To understand the application of computers in pattern making.

Course Outcome:

On successful Completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Understand** the different techniques used pattern drafting for men's wear	**BT Level 1**
CO2	**Create** patterns for formal wear for both men's and women's wear	**BT Level 2 & 3**
CO3	**Create** final collection using the patterns developed	**BT Level 4**

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Department Specific Elective (DSE)

Title of the paper: Menswear Design & Development

Course Objective:

The objectives of the subject is to design and develop a complete range of Menswear and learn the in-depth details of menswear by doing market research to final designing of the product.

Course Outcome:

On successful Completion of the course the students will be able to :

SI No	Course Outcome	Blooms Taxonomy Level
CO1	**Understand** the basic designing concept for men's wear	BT Level 1
CO2	**Apply** different techniques to create design for men's wear	BT level 2
CO3	**Construct** different types of patterns for men's wear	BT Level 3
CO4	**Classify** and **construct** different patterns for men's wear according to different sizes	BT Level 4

Department Specific Elective (DSE)

Title of the paper: Entrepreneurship Management

Course Objective:

The objectives of the subject is to enhance the entrepreneurship and management skills of the students by teaching them the traits of an entrepreneur- preparation & planning of a fashion business

Course Outcome:

On successful Completion of the course the students will be able to :

SI No	Course Outcome	Blooms Taxonomy Level
CO1	**To Understand** of the infrastructural set up and mode of functioning of the industry	BT Level 1
CO2	**To Classification** of the psychographic to demographic profile of the customer segment, the production system right upto the development of a commercially viable range	BT level 2
CO3	**Identify** their area of interest for own branding	BT Level 3
CO4	**Prepare** their own business plan for future	BT Level 4 and BT Level 3

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Title of the Paper: Sustainable Product Development

Course objective:

The objectives of the subject is to help the students study and understand sustainable clothing and its influence in today's fashion industry and modern life.

Course Outcome:

On successful Completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Identify** basic sustainability principles relevant to product development	**BT Level 1**
CO2	**Analyze** and **recognize** the environmental and social impacts of different product design choices.	**BT level 3**
CO3	**Design and develop** sustainable products by integrating eco-friendly materials and manufacturing processes	**BT Level 3**
CO4	**Implement** sustainable product development practices by analyzing the environmental impact of various design choices, selecting materials and manufacturing processes that minimize resource consumption and waste generation	**BT Level 4**

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Skill Enhancement Course
Title of the Paper: Fashion Styling & Photography

Course objective:

1.The objectives of the subject is to identify current trends in fashion imagery.
2. Schedule, coordinate and prop multiple model shoots and locations.
3. Create a studio still life of a fashion or beauty product

Course Outcome:

On successful completion of the course the students will be able to :		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	To **understand** the concept of styling	**BT Level 1**
CO2	Classification of different types of styles	**BT level 3**
CO3	**Applying** different types looks	**BT Level 3**
CO4	**Creating** looks inspired from sub cultures	**BT Level 4**

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GUWAHATI

Programme Outcomes and Course Outcome

B.Sc-Geology

The Assam Royal Global University

Guwahati – 35

The Assam Royal Global University IQAC Estd 2018

Director, IQAC
The Assam Royal Global University

1.1. Nature and extent of UG program in Geology

The UG program in Geology builds on the basic Geosciences if taught at the +2 level in all the schools in the country. Ideally, the +2 senior secondary school education should aim and achieve a sound grounding in understanding the basic concepts in Geosciences with sufficient content of topics from modern Geology and contemporary areas of exciting developments in geosciences to ignite the young minds. The curricula and syllabi are framed and implemented in such a way that the basic connection between theory and experiment and its importance in understanding Geology is apparent to the student. This is very critical in developing a scientific temperament and urge to innovate, create and discover in Geology. Unfortunately, the condition of our school system in most parts of the country lacks the facilities to achieve the above goal and it is incumbent upon the college/university system to fill the gaps in the knowledge creation of our young minds created by the lack of infrastructural and academic resources of our school system and strengthen their understanding in all the subjects through the UG programs specially in Geology and other science subjects.

The undergraduate program in Geology is presently being offered though the courses designed for granting B.Sc (Honours) Geology. The course is of three-year duration spread over six semesters after the higher secondary (+2) level Science course.

Sl. No.	Semester	Mandatory Credits to be Secured for the Award
1	1st	26
2	2nd	26
3	3rd	23
4	4th	21
5	5th	25
6	6th	25
Total Credits		**146**

Program Outcomes in B.Sc. (Honours) Geology

Upon satisfactory completion of B.Sc. (Honours) degree in Geology, the graduates will be able to achieve the following:

PO 1: Disciplinary Knowledge of Geology

- Ability to attain extensive and coherent knowledge and understanding of the academic field of Geology as a whole and its applications, and links to related disciplinary areas/subjects of study.

PO 2: Communication Skills

- Communicate the results of studies undertaken in the academic field of Geology accurately in a range of different contexts using the established and emerging concepts, constructs and techniques.

PO 3: Critical Thinking

- Develop skills in creative and critical thinking, analytical methods and integration of knowledge in multiple branches and will be able to formulate a scientific problem and strategies to solve it.

PO 4: Problem Solving

- Demonstrate the ability to use skills in Geology and its related areas of technology for formulating and tackling geosciences-related problems and identifying and applying appropriate geological principles and methodologies to solve a wide range of problems associated with geosciences.

PO 5: Analytical Reasoning

- Apply one's knowledge and understandings relating to Geology and skills to new/unfamiliar contexts and to identify and analyse problems and issues and seek solutions to real-life problems.

PO 6: Research-Related Skills

- Ability to identify research gaps, formulate research questions and ascertain relevant sources to find substantive explanations.

PO 7: Digital Literacy

- Ability to use digital sources for critical reading, data analysis, problem solving and presentations.

PO 8: Values: Moral, Ethical, Literary

- Ability to interrogate one's own ethical values, and to be aware of ethical issues.
- Ability to transfer such skills to other domains of one's life and work.

PO 9: Global Competency

- Demonstrate skills in identifying information needs, collection of relevant quantitative and/or qualitative geostatistical data drawing on a wide range of sources from the field and labs around the world, analyses and interpretation of data using methodologies as appropriate to the subject of Geology in the area of his/her specialization.

PO 10: Life-long Learning

- Graduate will acquire values and attitudes towards understanding complex environmental- economic-social challenges, and participating actively in solving current geological problems.

Program Specific Outcomes in B.Sc. (Honours) Geology

Upon completion of this programme the student will be able to:

PSO 1	**Academic competence:** (i) Understand fundamental concepts, principles and processes underlying the field of Geology, its different subfields and its linkage with related disciplinary areas/subjects. (ii) Demonstrate an understanding of a wide range of geological processes (e.g., genesis of rocks and formation of geological structures, formation of minerals and their alteration, effects of human activities at meso-microscale.) (iii) Undertake field tour in any part of India with respect to lithology, structure and stratigraphy and produce geological maps.
PSO 2	**Personal and Professional Competence:** (i) Carry out field mapping in any part of India with respect to lithology, structure and stratigraphy and produce geological maps. (ii) Analyse geological data and samples procured during field work. (iii) Formulate ideas, execute scientific writing and authentic reporting, geological maps, effective presentation and communication skills.
PSO 3	**Research Competence:** (i) Apply skills developed towards comprehension of geological conditions to address issues and find solutions in case of ground water, mineral and fossil fuel exploration and geo hazards. (ii) Integrate informatics and statistical skills to explore and authenticate field and laboratory data for experimental purpose.

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B. Sc. (Honours) Course in Geology: Semester-I

Paper I Core Course	PHYSICAL GEOLOGY

Course Objectives: Physical Geology is an introductory course that covers the fundamental principles of geology. It provides an understanding of the Earth's internal and external processes that shape the Earth's surface and subsurface features. This course covers a range of topics, including mineralogy, petrology, plate tectonics, structural geology, and geological time.

Course Outcomes:

1. Remembering: Recall the fundamental concepts of geology, including the rock cycle, plate tectonics, and geological time.
2. Understanding: Explain the processes that form the Earth's surface features and analyze the geological structures and their influence on the formation of natural resources.
3. Applying: Apply the principles of mineralogy and petrology to identify and classify different types of rocks and minerals, interpret geological maps and cross-sections, and solve geological problems.
4. Analyzing: Analyze geological structures and geological data to understand the distribution of rock units and geological structures.

Paper II Core Course	STRUCTURAL GEOLOGY

Course Objectives: Structural geology is a sub-discipline of geology that deals with the study of deformation and deformation-related structures of rocks at various scales. This course aims to provide a fundamental understanding of structural geology, including the analysis of structural data and the interpretation of deformation processes that occur in the Earth's crust.

Course Outcomes:

1. Remembering: Students will be able to recall the basic concepts, terminology, and principles of structural geology.
2. Understanding: Students will be able to comprehend the various types of rock deformation and deformation-related structures, including folds, faults, and joints.
3. Applying: Students will be able to apply their knowledge of structural geology to analyze and interpret geological maps and cross-sections.
4. Analysing: Students will be able to analyse structural data, including the measurement and plotting of various structural elements, such as strike, dip, and plunge.

Paper III Core Course	MINERAL SCIENCE

Course Objectives: Mineral Science is an undergraduate-level course that focuses on the study of minerals and their properties, including crystallography, optical properties, chemical composition, and physical characteristics. The course provides an overview of the formation and classification of minerals, as well as the processes involved in their identification and analysis.

Course outcomes:

1. Remembering: Recall and identify the properties of minerals, their classification, and crystallographic systems.
2. Understanding: Explain the physical and chemical properties of minerals and their significance in geological processes and exploration of mineral resources.
3. Applying: Apply mineralogical knowledge to identify minerals using optical microscopy and X-ray diffraction techniques.
4. Analysing: Analyse mineral assemblages and their distribution in rocks to understand the origin and evolution of geological processes.

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Paper IV SEC	FIELD GEOLOGY - I

Course Objectives: This course is designed to provide students with hands-on experience in geologic field methods and techniques. Topics covered will include geologic mapping, structural geology, stratigraphy, and palaeontology. Students will participate in field trips to local geologic sites and will be required to prepare geologic maps and reports.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to geologic field methods and techniques.
2. Understanding: Students will be able to explain the fundamental principles and processes of geologic field methods and techniques, including geologic mapping, structural geology, stratigraphy, and palaeontology.
3. Applying: Students will be able to apply geologic field methods and techniques to collect, record, and interpret geologic data from field sites.
4. Analysing: Students will be able to analyse geologic field data to identify geologic structures, interpret stratigraphic relationships, and reconstruct geologic histories.
5. Evaluating: Students will be able to evaluate the quality and reliability of geologic data collected in the field, and assess the strengths and weaknesses of different field techniques and methods.
6. Creating: Students will be able to design and execute a geologic field project, including developing hypotheses, collecting and analysing data, and presenting findings.

Paper: GE 1 Generic Elective	ESSENTIALS OF GEOLOGY

Course Objectives: This course introduces students to the fundamental concepts and principles of geology. Topics covered will include the structure and composition of Earth, plate tectonics, Earth's history and geological time scale. Students will develop an understanding of the processes that shape Earth's surface and subsurface, and the role of geology in society and the environment.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the basic concepts, principles, and terminology of geology.
2. Understanding: Students will be able to explain the fundamental processes and phenomena that shape Earth's surface and subsurface, and the role of geology in society and the environment.
3. Applying: Students will be able to apply geologic principles and concepts to analyze and solve problems related to Earth's structure, composition, and history.
4. Analyzing: Students will be able to analyze geologic data to interpret the physical and chemical properties of Earth materials, and to evaluate the role of these materials in shaping Earth's geologic history.

Paper: GE 2 Generic Elective	Fundamentals of Geology

Course Objectives: This course introduces students to the fundamental concepts and principles of geology. Topics covered will include the structure and composition of Earth, plate tectonics, Earth's history, minerals and rocks, natural hazards, and the environment. Students will develop an understanding of the processes that shape Earth's surface and subsurface, and the role of geology in society and the environment.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the basic concepts, principles, and terminology of geology.
2. Understanding: Students will be able to explain the fundamental processes and phenomena that shape Earth's surface and subsurface, and the role of geology in society and the environment.
3. Applying: Students will be able to apply geologic principles and concepts to analyze and solve problems related to Earth's structure, composition, and history.
4. Analyzing: Students will be able to analyze geologic data to interpret the physical and chemical properties of Earth materials, and to evaluate the role of these materials in shaping Earth's geologic history.

Paper: AECC 1	**Communicative English - I: Developing Oral Communication and Listening**

Course Objectives:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities

Course Outcomes:

After the completion of course, students will be expected to:

- Have a knowledge of Communication process, verbal, and non-verbal communication
- Improve the skill of listening processes
- Develop a life skill on oral group communication- group discussion leadership skills, team management.
- Have a basic idea of language styles – oral and written communication.

Paper: AECC 2	**Behavioural Science - I**

Course Objectives:

To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

After the completion of course, students will be expected to:

- Understand self-identity and identity crisis
- Understand self-esteem.
- Have in depth knowledge of foundation of individual behaviour.
- Develop a life skill on Time management
- Have an idea on barriers of communication.

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B. Sc. (Honours) Course in Geology: Semester-II

Paper I Core Course	IGNEOUS PETROLOGY

Course Objectives: Igneous Petrology is a course designed to provide an understanding of the origin, classification, textures, and mineralogy of igneous rocks. The course will cover the processes that lead to the formation of magmas, their emplacement and crystallization, and the resultant diversity of igneous rocks. The course will also explore the relationship between igneous processes and tectonic settings.

Course outcomes:

1. Remembering: Classify igneous rocks based on their mineralogy and textures.
2. Understanding: Describe the processes involved in the formation of magmas and their subsequent crystallization into igneous rocks. Explain the relationship between igneous processes and tectonic settings.
3. Applying: Analyse and interpret igneous rock suites using microscopic and macroscopic techniques.
4. Analysing: Evaluate the applications of igneous petrology in geologic exploration and mineral resource identification.

Paper II Core Course	METAMORPHIC PETROLOGY

Course Objectives: This course provides an in-depth understanding of the origin, classification, and petrological properties of metamorphic rocks. Students will learn about the various metamorphic processes, including the role of fluids and deformation, and how these processes influence mineral assemblages and textures. The course also covers the use of metamorphic petrology in understanding the tectonic and thermal history of a region.

Course outcomes:

1. Remembering: Describe the classification and nomenclature of metamorphic rocks.
2. Understanding: Identify and interpret the mineral assemblages and textures of metamorphic rocks, and explain their significance.
3. Applying: Apply knowledge of metamorphic processes and petrographic techniques to identify and interpret metamorphic rocks and their evolution.
4. Analysing: Analyse the factors that control the metamorphic process, including pressure, temperature, fluids, and deformation.

Paper III Core Course	GEOCHEMISTRY

Course Objectives: Geochemistry is the study of the chemical composition, structure, and processes of the Earth and other planets. This course covers the fundamentals of geochemistry, including the principles of thermodynamics, kinetics, isotope geochemistry, and major and trace element geochemistry.

Course Outcomes:

1. Remembering: Recall the basic concepts of geochemistry, including thermodynamics, kinetics, and isotope geochemistry.
2. Understanding: Understand the principles of major and trace element geochemistry and their applications in geological systems.
3. Applying: Apply geochemical methods to investigate geological processes and solve geological problems.
4. Analysing: Analyse geochemical data using appropriate statistical and graphical techniques.

Paper IV SEC	FIELD GEOLOGY - II

Course Objectives: This course is designed to provide students with hands-on experience in geologic field methods and techniques. Topics covered will include geologic mapping, structural geology, stratigraphy, and palaeontology. Students will participate in field trips to local geologic sites and will be required to prepare geologic maps and reports.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to geologic field methods and techniques.
2. Understanding: Students will be able to explain the fundamental principles and processes of geologic field methods and techniques, including geologic mapping, structural geology, stratigraphy, and palaeontology.
3. Applying: Students will be able to apply geologic field methods and techniques to collect, record, and interpret geologic data from field sites.
4. Analysing: Students will be able to analyse geologic field data to identify geologic structures, interpret stratigraphic relationships, and reconstruct geologic histories.
5. Evaluating: Students will be able to evaluate the quality and reliability of geologic data collected in the field, and assess the strengths and weaknesses of different field techniques and methods.
6. Creating: Students will be able to design and execute a geologic field project, including developing hypotheses, collecting and analysing data, and presenting findings.

Paper: GE 3 Generic Elective	Rocks and Minerals

Course Objectives: This course is designed to provide students with a comprehensive understanding of rocks and minerals, including their classification, properties, formation, and distribution on Earth. The course will cover topics such as mineral identification, crystallography, petrography, and the geological processes that shape rocks and minerals.

Course Outcomes:

1. Remembering: Students will be able to recall the basic concepts and terminology of rocks and minerals, including their classification and properties.
2. Understanding: Students will be able to explain the formation and geological processes that shape rocks and minerals.
3. Applying: Students will be able to apply their knowledge of rocks and minerals to identify different types of minerals and rocks in hand samples and thin sections.
4. Analysing: Students will be able to analyse the textures and structures of rocks and minerals using various techniques, such as petrographic microscopy.

Paper: GE 4 Generic Elective	EARTH SCIENCES

Course Objectives: This course provides a broad overview of the interdisciplinary field of Earth Sciences, which encompasses geology, meteorology, oceanography, and astronomy. Students will explore the processes that shape the Earth's surface, the dynamics of the Earth's atmosphere and oceans, and the formation and evolution of the solar system. The course will introduce students to the methods and tools used in Earth Science research and the interdisciplinary nature of the field.

Course Outcomes:

1. Remembering: Students will recall and identify the major components and processes of the Earth system and the principles of plate tectonics.
2. Understanding: Students will describe and explain the relationships between the Earth's systems, including the effects of human activities on the Earth's environment.
3. Applying: Students will apply their knowledge of Earth Science to analyse and interpret maps and geospatial data.
4. Analysing: Students will evaluate the dynamics of the Earth's atmosphere and oceans and the impact of climate change on the Earth's systems.

Paper: AECC 3	**Communicative English - II: Conversation and Public Speaking** **L**

Course Objectives:
The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes:
After the completion of course, students will be expected to:

- Improve speaking skill.
- Develop a life skill on conversation.
- Improve the skill of public speaking.

Paper: AECC 4	**Behavioural Science - I**

Course Objectives:
To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:
After the completion of course, students will be expected to:

- Understand culture and personality
- Understand Value.
- Demonstrate leadership
- Develop a life skill on motivation

B. Sc. (Honours) Course in Geology: Semester-III

Paper I Core Course	**SEDIMENTOLOGY**

Course Objectives: This course will focus on the processes of sedimentation, the diagenesis of sediments, and the properties and classification of sedimentary rocks. Topics covered will include sedimentary environments, depositional processes, sedimentary structures, mineralogy, texture, and sedimentary rock classification. The course will also cover the interpretation of sedimentary rocks in terms of paleoenvironmental and paleoclimatic conditions.

Course outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to sedimentary petrology.
2. Understanding: Students will be able to explain the processes of sedimentation, diagenesis, and lithification that result in the formation of sedimentary rocks.
3. Applying: Students will be able to apply the principles and concepts of sedimentary petrology to analyze and interpret the origin, composition, and classification of sedimentary rocks.
4. Analysing: Students will be able to analyse sedimentary rocks in terms of their texture, mineralogy, sedimentary structures, and depositional environments.

Paper II Core Course	**PALAEONTOLOGY**

Course Objectives: Palaeontology is the study of ancient life, focusing on the evolution, diversity, and extinction of organisms over geological time. This course will cover the history and methods of palaeontological research, the principles of evolutionary biology, and the study of fossils as evidence of past life. Topics covered will include the origin and evolution of life, major extinction events, the use of fossils in stratigraphy, and the interpretation of the ecological and biogeographic contexts of ancient ecosystems.

Course outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to the study of palaeontology.
2. Understanding: Students will be able to explain the principles of evolutionary biology and the methods used in palaeontological research.
3. Applying: Students will be able to apply palaeontological principles to identify, describe, and interpret the significance of fossils in the context of past life and environments.
4. Analysing: Students will be able to analyse the morphology, diversity, and distribution of fossil organisms and their significance in the evolutionary history of life.

Paper III DSE Course	**GEOMORPHOLOGY**

Course Objectives: Geomorphology is the study of landforms, their processes, and the evolution of the Earth's surface. This course will explore the fundamental principles and processes of geomorphology, including the study of landforms and their origin, the mechanics of surface processes, and the impact of climate, tectonics, and human activity on landform evolution.

Course outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to the study of geomorphology.
2. Understanding: Students will be able to explain the fundamental principles and processes of geomorphology, including the origin and evolution of landforms and the mechanics of surface processes.
3. Applying: Students will be able to apply geomorphological principles to analyze and interpret the formation of landforms, including mountain ranges, rivers, glaciers, and coastlines.
4. Analysing: Students will be able to analyse the impact of climate, tectonics, and human activity on landform evolution, and evaluate the interactions between these factors.

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Paper IV DSE Course	RIVER SCIENCE

Course Objectives: River Science is an interdisciplinary field of study that focuses on the physical, chemical, and biological processes that govern the behaviour of rivers and streams. This course will introduce students to the fundamental principles of River Science, including the study of water flow, sediment transport, river morphology, and ecology. Students will learn how to use field and laboratory techniques to collect and analyse data, and will gain an understanding of the role of rivers in shaping landscapes and ecosystems.

Course outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to River Science, including the properties of water, sediment, and river channels.
2. Understanding: Students will be able to explain the fundamental principles of River Science, including water flow, sediment transport, river morphology, and ecology.
3. Applying: Students will be able to apply River Science principles to analyse and interpret data from field and laboratory experiments, and to design and conduct their own research projects.
4. Analysing: Students will be able to analyse the interactions between physical, chemical, and biological processes in river ecosystems, and evaluate the impact of human activities on these processes.

Paper V	PROJECT

Course Objectives: This course is designed to provide students with hands-on experience in geologic field methods and techniques. Topics covered will include geologic mapping, structural geology, stratigraphy, and palaeontology. Students will participate in field trips to local geologic sites and will be required to prepare geologic maps and reports.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to geologic field methods and techniques.
2. Understanding: Students will be able to explain the fundamental principles and processes of geologic field methods and techniques, including geologic mapping, structural geology, stratigraphy, and palaeontology.
3. Applying: Students will be able to apply geologic field methods and techniques to collect, record, and interpret geologic data from field sites.
4. Analysing: Students will be able to analyse geologic field data to identify geologic structures, interpret stratigraphic relationships, and reconstruct geologic histories.
5. Evaluating: Students will be able to evaluate the quality and reliability of geologic data collected in the field, and assess the strengths and weaknesses of different field techniques and methods.
6. Creating: Students will be able to design and execute a geologic field project, including developing hypotheses, collecting and analysing data, and presenting findings.

B. Sc. (Generic Elective) Course in Geology: Semester-III

Paper: GE 5 Generic Elective	PHYSICS AND CHEMISTRY OF EARTH

Course Objectives: This course explores the fundamental principles of physics and chemistry that govern Earth's geologic processes. Topics covered will include thermodynamics, mineralogy, geochemistry, and geophysics. Students will develop an understanding of the physical and chemical properties of Earth materials and their role in shaping Earth's structure, composition, and evolution.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to the physics and chemistry of Earth.
2. Understanding: Students will be able to explain the fundamental principles and processes of physics and chemistry that govern Earth's geologic processes.
3. Applying: Students will be able to apply physical and chemical principles to analyze geologic data and solve problems related to Earth's structure, composition, and evolution.
4. Analyzing: Students will be able to analyze geologic data to interpret the physical and chemical properties of Earth materials, and to evaluate the role of these materials in shaping Earth's geologic history.

Paper: GE 6 Generic Elective	Fundamentals of Geology

Course Objectives: This course introduces students to the fundamental concepts and principles of geology. Topics covered will include the structure and composition of Earth, plate tectonics, Earth's history, minerals and rocks, natural hazards, and the environment. Students will develop an understanding of the processes that shape Earth's surface and subsurface, and the role of geology in society and the environment.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the basic concepts, principles, and terminology of geology.
2. Understanding: Students will be able to explain the fundamental processes and phenomena that shape Earth's surface and subsurface, and the role of geology in society and the environment.
3. Applying: Students will be able to apply geologic principles and concepts to analyze and solve problems related to Earth's structure, composition, and history.
4. Analyzing: Students will be able to analyze geologic data to interpret the physical and chemical properties of Earth materials, and to evaluate the role of these materials in shaping Earth's geologic history.

B. Sc. (Honours) Course in Geology: Semester-IV

Paper I Core Course	PRINCIPLES OF STRATIGRAPHY

Course Objectives: This course provides an introduction to the fundamental principles and concepts of stratigraphy. Students will learn about the methods and techniques used to study and interpret the layers of rocks that make up Earth's crust, including the principles of relative and absolute dating, correlation, and stratigraphic nomenclature. The course will also cover the major events and processes that have shaped Earth's geologic history, as recorded in the rock record.

Course outcomes:

1. Remembering: Students will be able to recall and recognize the basic concepts, principles, and terminology of stratigraphy.
2. Understanding: Students will be able to explain the fundamental processes and phenomena that shape the rock record, and the principles and methods used to study and interpret stratigraphic data.
3. Applying: Students will be able to apply stratigraphic principles and techniques to analyse and interpret geologic data and to reconstruct the geologic history of a region.
4. Analysing: Students will be able to analyse the spatial and temporal relationships between rock units, and to evaluate the relative ages and depositional environments of these units.
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Paper II Core Course	INDIAN STRATIGRAPHY

Course Objectives: This course is designed to provide an overview of the stratigraphic framework of India. It will cover the geological history of the Indian subcontinent, the different stratigraphic units, and their characteristics. The course will also discuss the tectonic and depositional history of India and its relationship with the surrounding regions.

Course outcomes:

1. Remember: Identify and recall the different stratigraphic units in India and their characteristics.
2. Understand: Explain the geologic history of the Indian subcontinent and the tectonic and depositional history of India and its relationship with the surrounding regions.
3. Apply: Apply the principles of stratigraphy in the interpretation of the geological history of India.
4. Analyse: Analyse the economic significance of the different stratigraphic units and interpret the depositional environments of the different stratigraphic units.

Paper III DSE Course	EARTH AND CLIMATE

Course Objectives: This course aims to provide students with an understanding of the Earth's climate system, including its components, interactions, and variability over different time scales. The course will cover the basic principles of atmospheric science, oceanography, and paleoclimate, and their applications in climate modelling, climate change, and environmental issues.

Course outcomes:

1. Remember: Students should be able to recall the basic concepts and terminology used in Earth and Climate science, including atmospheric and oceanic circulation, radiative forcing, greenhouse gases, and climate proxies.
2. Understand: Students should be able to explain the fundamental physical and chemical processes that govern the Earth's climate system, including energy balance, feedback mechanisms, and climate variability.
3. Apply: Students should be able to apply their knowledge of Earth and Climate science to analyse and interpret climate data, and to evaluate the scientific evidence for climate change and its impacts on natural and human systems.
4. Analyse: Students should be able to analyse the complexity and uncertainty of climate science, including the role of natural and anthropogenic factors in climate change, and the challenges of climate prediction and mitigation.

Paper IV DSE Course	SOIL GEOLOGY

Course Objectives: This course introduces students to the study of soils as a natural resource and its relationship with geology. Students will learn about the physical, chemical, and biological properties of soils, and how these properties relate to geological processes and history. The course will cover topics such as soil formation, classification, nutrient cycles, and land use, as well as the environmental impact of soil degradation and conservation.

Course outcomes:

1. Remembering: Students will recall and identify the basic properties of soils and the geologic processes involved in soil formation.
2. Understanding: Students will describe and explain the relationships between soils and geology, including the effects of weathering and erosion on soil properties.
3. Applying: Students will apply their knowledge of soil geology to analyse and interpret soil profiles and properties.
4. Analysing: Students will evaluate the environmental impact of soil degradation and develop strategies for sustainable land use.

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Paper V SEC	FIELD GEOLOGY - III

Course Objectives: This course is designed to provide students with hands-on experience in geologic field methods and techniques. Topics covered will include geologic mapping, structural geology, stratigraphy, and palaeontology. Students will participate in field trips to local geologic sites and will be required to prepare geologic maps and reports.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to geologic field methods and techniques.
2. Understanding: Students will be able to explain the fundamental principles and processes of geologic field methods and techniques, including geologic mapping, structural geology, stratigraphy, and palaeontology.
3. Applying: Students will be able to apply geologic field methods and techniques to collect, record, and interpret geologic data from field sites.
4. Analysing: Students will be able to analyse geologic field data to identify geologic structures, interpret stratigraphic relationships, and reconstruct geologic histories.
5. Evaluating: Students will be able to evaluate the quality and reliability of geologic data collected in the field, and assess the strengths and weaknesses of different field techniques and methods.
6. Creating: Students will be able to design and execute a geologic field project, including developing hypotheses, collecting and analysing data, and presenting findings.

Paper: GE 7 Generic Elective	Earth Surface Processes			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEOL162G401

Course Objectives: This course provides an introduction to the physical and chemical processes that shape the Earth's surface. The course covers the fundamental concepts and principles of weathering, erosion, sediment transport, and deposition, with an emphasis on the interactions between these processes and the Earth's climate and tectonic activity.

Course Outcomes:

1. Remembering: Recall the fundamental concepts and principles of Earth surface processes.
2. Understanding: Explain the role of climate and tectonic activity in shaping the Earth's surface.
3. Applying: Analyse and interpret data on sediment transport and deposition using basic mathematical and statistical methods.
4. Evaluating: Evaluate the impact of human activity on Earth surface processes.

Paper: GE 8 Generic Elective	EARTH SCIENCES

Course Objectives: This course provides a broad overview of the interdisciplinary field of Earth Sciences, which encompasses geology, meteorology, oceanography, and astronomy. Students will explore the processes that shape the Earth's surface, the dynamics of the Earth's atmosphere and oceans, and the formation and evolution of the solar system. The course will introduce students to the methods and tools used in Earth Science research and the interdisciplinary nature of the field.

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Course Outcomes:

1. Remembering: Students will recall and identify the major components and processes of the Earth system and the principles of plate tectonics.
2. Understanding: Students will describe and explain the relationships between the Earth's systems, including the effects of human activities on the Earth's environment.
3. Applying: Students will apply their knowledge of Earth Science to analyse and interpret maps and geospatial data.
4. Analysing: Students will evaluate the dynamics of the Earth's atmosphere and oceans and the impact of climate change on the Earth's systems.

B. Sc. (Honours) Course in Geology: Semester-V

Paper I Core Course	**HYDROGEOLOGY**

Course Objectives: This course introduces students to the fundamental principles of groundwater, including the physical and chemical properties of water, aquifer types and characteristics, groundwater flow, well design and construction, and groundwater contamination. The course also covers water resources management and environmental issues related to groundwater.

Course outcomes:

1. Remembering: Define and explain the basic principles of hydrogeology, including groundwater flow, aquifer types, and hydraulic conductivity.
2. Understanding: Evaluate the relationship between groundwater and surface water, including water budgeting and streamflow measurement.
3. Applying: Apply Darcy's Law to calculate groundwater flow rates and velocities.
4. Analysing: Analyse hydrogeologic data to determine aquifer properties and hydraulic conductivity.

Paper II Core Course	**ECONOMIC GEOLOGY**

Course Objectives: This course provides an introduction to the principles and practices of economic geology, with a focus on the identification, exploration, and exploitation of mineral resources. Topics covered include ore genesis, mineral deposits, and exploration techniques, as well as the economic, social, and environmental impacts of mineral extraction.

Course outcomes:

1. Remembering: Recall the basic principles and concepts of economic geology.
2. Understanding: Explain the geological processes that lead to the formation of mineral deposits.
3. Applying: Apply different exploration techniques to identify mineral deposits in a given area.
4. Analysing: Analyse the economic, social, and environmental impacts of mineral extraction.

Paper: DSE 1	**Remote Sensing and GIS**

Course Objectives: This course introduces the fundamental principles of remote sensing and Geographic Information Systems (GIS) and their applications in Earth Sciences. The course covers the principles of electromagnetic radiation, remote sensing sensors, and image interpretation techniques. Students will also learn the basic concepts of GIS and spatial analysis.

Course outcomes:

1. Remembering: Recall basic concepts and facts related to remote sensing and GIS.
2. Understanding: Explain the principles and theories behind remote sensing and GIS techniques.
3. Applying: Apply remote sensing and GIS techniques to analyse and interpret spatial data.
4. Analysing: Analyse and interpret remotely sensed data to derive meaningful information.

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Paper: DSE 2	CLIMATOLOGY AND OCEANOGRAPHY

Course Objectives: This course provides an introduction to the basic principles and concepts of climatology and oceanography. It covers the study of atmospheric and oceanic circulation patterns, climate variability, climate change, and their impacts on human societies and the environment.

Course outcomes:

1. Remembering: Define key terms and concepts related to climatology and oceanography.
2. Understanding: Explain the physical, chemical, and biological processes that govern the earth's climate and ocean systems.
3. Applying: Apply the concepts and techniques of climatology and oceanography to analyse real-world problems.
4. Analysing: Analyse and interpret data from various sources to understand climatic and oceanographic phenomena.

Paper: DSE 3	EXPLORATION GEOLOGY

Course Objectives: This course provides an overview of the principles and methods of mineral exploration geology. It covers topics such as geological mapping, geophysical and geochemical exploration methods, drilling techniques, and mineral resource assessment. The course aims to develop skills in exploration geology and mineral resource evaluation.

Course outcomes:

1. Knowledge: Understand the principles and techniques of mineral exploration, including geological mapping, geophysical surveys, drilling, and sampling.
2. Understanding: Understand the principles and methods of exploration geology, and its role in resource discovery and evaluation.
3. Application: Apply geological knowledge and techniques to design and implement exploration programs for a variety of mineral deposits.
4. Analysis: Evaluate the effectiveness of different exploration methods and their limitations in various geological settings.

B. Sc. (Honours) Course in Geology: Semester-VI

Paper I Core Course	ENGINEERING GEOLOGY			Subject Code:
	L-T-P-C: 2-0-4-4	Credit Units: 4	Scheme of Evaluation: (T + P)	GEOL162C641

Course Objectives: This course covers the study of geology in relation to civil engineering and construction. The course emphasizes the application of geological knowledge in site investigation, planning, design, construction, and maintenance of civil engineering projects.

Course outcomes:

1. Knowledge: Students will be able to define and explain the principles and concepts of engineering geology.
2. Understand: Students will be able to interpret and understand geological data for engineering purposes.
3. Application: Students will be able to apply geological knowledge in solving engineering problems and making decisions related to civil engineering projects.
4. Analysis: Students will be able to evaluate and assess the geological hazards and risks associated with civil engineering projects.

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Paper II Core Course	FUEL GEOLOGY

Course Objectives: This course introduces the students to the exploration, extraction, and utilization of fuel resources, including coal, oil, and gas. The course provides an overview of the geological processes involved in the formation of these resources, their occurrence, and distribution, as well as the methods used to extract and refine them.

Course outcomes:

1. Describe the geological processes that lead to the formation of coal, oil, and gas deposits. (Remembering)
2. Understand the physical and chemical properties of different types of fuel resources. (Understanding)
3. Evaluate the economic and environmental impact of fuel resource exploration, extraction, and utilization. (Evaluating)
4. Apply geological concepts and techniques to identify potential fuel resource sites. (Applying)

Paper: DSE 1	EVOLUTION OF LIFE THROUGH TIME

Course Objectives: The course "Evolution of Life Through Time" explores the origin and evolution of life on Earth. It covers the geological time scale and the major events in Earth's history that have influenced the development of life. Students will learn about the evolution of single-celled organisms, the diversification of life during the Cambrian explosion, the rise of vertebrates, and the evolution of humans. The course will also focus on the methods and tools used to study the history of life, including palaeontology, molecular biology, and biogeography.

Course outcomes:

1. Remembering: Students will be able to recall important events and milestones in the evolution of life on Earth.
2. Understanding: Students will be able to explain the processes and mechanisms that have driven the evolution of life, as well as the scientific methods used to study it.
3. Applying: Students will be able to apply their understanding of evolutionary concepts to analyse and interpret scientific data and observations.
4. Analysing: Students will be able to critically evaluate different hypotheses and models of evolutionary history, and assess their evidence.

Paper: DSE 2	PLANETARY GEOLOGY

Course Objectives: This course is designed to introduce undergraduate students to the geological processes, surface features, and history of the planets and moons in our solar system. Through lectures, readings, and hands-on activities, students will explore the formation and evolution of planetary bodies, the role of impact cratering, volcanism, tectonics, and erosion in shaping their surfaces, and the search for life beyond Earth.

Course outcomes:

1. Remembering: Students will be able to recall the names, physical characteristics, and orbital properties of the planets and moons in our solar system, as well as key geological features and events associated with each body.
2. Understanding: Students will be able to explain the geological processes responsible for the formation and evolution of planets and moons, as well as the methods used to study planetary geology.
3. Applying: Students will be able to analyse and interpret geological data from planetary missions and map planetary surfaces using topographic and geologic maps.
4. Analysing: Students will be able to evaluate competing theories and hypotheses related to the formation and evolution of planets and moons based on geological evidence.

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Paper: DSE 3	ANALYTICAL GEOLOGY

Course Objectives: Analytical Geology is an undergraduate level course that provides an introduction to various analytical techniques used in geology. The course focuses on the application of chemical, physical, and mathematical techniques in geology, and provides students with an understanding of how these techniques are used in the analysis of geological materials.

Course outcomes:

1. Remembering: Students will be able to recall and describe the principles and techniques used in analytical geology, such as spectroscopy, X-ray diffraction, and chromatography.
2. Understanding: Students will be able to explain the theoretical basis and limitations of different analytical methods, and interpret data obtained from them.
3. Applying: Students will be able to apply analytical techniques to solve problems related to the identification and characterization of rocks and minerals.
4. Analysing: Students will be able to analyse and evaluate the quality and reliability of analytical data, and draw conclusions based on it.

Paper: DSE 4	INTRODUCTION TO GEOPHYSICS

Course Objectives: Introduction to Geophysics is an undergraduate level course designed to provide an overview of various geophysical techniques used to study the Earth's subsurface. The course covers the basic principles of geophysics, such as seismic, magnetic, gravity, and electrical methods, and their applications in geological and environmental studies. The course also includes practical exercises and fieldwork to enhance the students' understanding of geophysical data acquisition and interpretation.

Course outcomes:

1. Recall the basic principles and concepts of geophysics, including seismic, magnetic, gravity, and electrical methods. (Remembering)
2. Interpret and analyse geophysical data obtained from different methods to study the Earth's subsurface structures. (Understanding and Analysing)
3. Design and conduct geophysical surveys for geological and environmental studies. (Applying)

Paper SEC	FIELD GEOLOGY - IV

Course Objectives: This course is designed to provide students with hands-on experience in geologic field methods and techniques. Topics covered will include geologic mapping, structural geology, stratigraphy, and palaeontology. Students will participate in field trips to local geologic sites and will be required to prepare geologic maps and reports.

Course Outcomes:

1. Remembering: Students will be able to recall and recognize the key concepts, principles, and facts related to geologic field methods and techniques.
2. Understanding: Students will be able to explain the fundamental principles and processes of geologic field methods and techniques, including geologic mapping, structural geology, stratigraphy, and palaeontology.
3. Applying: Students will be able to apply geologic field methods and techniques to collect, record, and interpret geologic data from field sites.
4. Analysing: Students will be able to analyse geologic field data to identify geologic structures, interpret stratigraphic relationships, and reconstruct geologic histories.
5. Evaluating: Students will be able to evaluate the quality and reliability of geologic data collected in the field, and assess the strengths and weaknesses of different field techniques and methods.
6. Creating: Students will be able to design and execute a geologic field project, including developing hypotheses, collecting and analysing data, and presenting findings.

Anuradha Deo

THE ASSAM
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GUWAHATI

Programme Outcomes and Course Outcome

BA-Economics

The Assam Royal Global University

Guwahati – 35

Anuradha Dev

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1.1 Nature and Extent of bachelor's degree Programme in Economics (Honours)

A bachelor's degree in economics with Research is a 3-year degree course which is divided into 8 semesters as under.

Bachelor's Degree (Honours) is a well-recognized, structured, and specialized graduate level qualification in tertiary, collegiate education. The contents of this degree are determined in terms of knowledge, understanding, qualification, skills, and values that a student intends to acquire to look for professional avenues or move to higher education at the postgraduate level.

Bachelor's Degree (Honours) programmes attract entrants from the secondary level or equivalent, often with subject knowledge that may or may not be directly relevant to the field of study/profession. Thus, BA (Honours) Course in Economics aims to equip students to qualify for joining a profession or to provide development opportunities in particular employment settings. Graduates are enabled to enter a variety of jobs or to continue academic study at a higher level.

1.2 Programme learning outcomes relating to B.A. (Honours) degree programme in Economics

The students graduating with the Degree B.A (H) in Economics will be able to:

PO 1: Disciplinary Knowledge

- Attain domain knowledge for understanding the origin and the developments in the respective disciplines.

PO 2: Communication Skills

- Acquire the essential language skills and job skills, to speak flawlessly, to write effectively and to create works of art/texts to get placed in lucrative positions.

PO 3: Critical Thinking

- Develop the ability of conceptualizing knowledge gathered through the learning processes.

PO 4: Problem Solving Skills

- Develop interpretation skill, analytical skill, and research related skills to analyse socio-political, socio-religious and the economic conditions prevail through the ages globally and to adopt the solutions suggested to end up social / economic / political issues.

PO 5: Analytical Reasoning

- Develop the ability to collect information and to thoroughly analyze that information.

PO 6: Digital Literacy

- Get access to digital resources, to use them judiciously for updating of knowledge and to engage in remote/ independent learning.

PO 7: Research-related skills

- Economics is research-based subject. Students are asked prepare project report regularly which brings about the sense of inquiry and capability for asking relevant/appropriate questions.

PO 8: Moral and Ethical Values / Multicultural Competence

- Imbibe moral and ethical values for upholding uprightness, solidarity and sovereignty to live a dignified life.
- Comprehend the local, national, and global principles / policies / perspectives dealt with in texts to foster global peace.

PO 9: Cooperation/Teamwork

- Capable of working effectively in diverse teams in both classroom and field-based situations.

PO 10: Self-Directed Learning / Lifelong Learning

- Prepare them for personal and professional effectiveness and to practise it throughout the life to become law-abiding and productive citizens.

PO 11: Environmental Conservation and Sustainability

- Realise that environment and humans are dependent on one another and to know about the responsible management of our ecosystem for survival and for the well-being of the future generation as well.

Programme Specific Outcomes (PSO)

Upon completion of B.A (H) Economics Degree Programme, the students will be able to:

PSO1	An ability to understand economic theories and functioning of basic microeconomic and macroeconomic systems.
PSO2	Acquaint with collection, organization, tabulation and analysis of empirical data. Ability to use basic mathematical and statistical tools to solve real economic problems
PSO 3	Acquaint with basic and applied econometric tools and methods used in economics. The aim of this course is to provide a foundation in applied econometric analysis and develop skills required for empirical research in economics.
PSO 4	Delineate the developmental policies designed for developed and developing economics.

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Semester – I

Paper I/Subject Name: Microeconomics-I

Course Objective:

The purpose of this course (Microeconomics) is to give students a thorough understanding of the principles of Economics to make the students acquaint with the glorious background of origin, definitions, and scope of Economics: to familiarize the students with Consumer Behaviour, Production Functions and Allocation of Scare Resources and provide them a proper understanding of cost, revenue, scale of returns and the different Market Structures.

Course Outcomes (CO):

On completion of this course students will be expected to -

1. **Recall** basic concepts like-definition of Economics, Subject matters, economic problems etc. (BT level 1)
2. **Explain** how to gauge consumer behaviour, convert desire into demand, create supply and strike equilibrium between the two. (BT level 2)
3. **Illustrate** economic use of scarce resources, their optimal use in different market conditions, price, and output determinations. (BT level 2)
4. **Apply** the behavioural knowledge of utilizing scarce resources in their day-to-day life. (BT level 3)

Semester – I

Paper I/Subject Name: Macro Economics-I

Course Objective:

The objective of the course is to introduce students to understand the aggregative behaviour of the economy. They will also learn about how to estimate national income. Keynesian theory plays an important role in macroeconomic theory. Thus, another objective of this course is to give knowledge of Keynesian economics.

Course Outcomes:

On completion of this course students will be expected to –

1. **Recall** the methods of computing national income accounting and basic concepts known as aggregates of national income like- GDP, GNP, NNP, NDP, personal income etc. (BT Level 1)
2. **Explain** classical macro-economic theory, causes of The Great Depression and advent of Keynesian economics. (BT Level 2)
3. **Illustrate** Keynesian economics- aggregate demand and supply, their role in determining equilibrium employment and income. (BT Level 2)

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Semester – I

Paper I/Subject Name: Quantitative Methods in Economics - I

Course Objective: This course is designed to provide a good grounding and an in depth understanding of the theory and application of differential calculus, and other techniques widely used in Economics. Topics of study include functions, univariate optimization, elasticity, financial mathematics, multivariate optimization, unconstrained optimization, matrices, integration etc.

Course Outcomes:

Students are expected to-

1. **Define** basic concepts like Function, variables, limit, continuation of function etc. (BT level 1)
2. **Construct** economic functions- like demand and supply functions. (BT level 2)
3. **Solve problems** of differentiation, matrices, and integration. (BT level 3)
4. **Solve problems** involving variables that discretely and continuously grow over time, and compute present discounted values, future compounded values, and rates of growth. (BT level 3)

Semester – I

Paper I/Subject Name: Data Collection and Analysis - I

Course objectives:

This is a skill enhancement course for data collection techniques and analysis. The students will be given hands on training on using statistical and computing software to better visualize and understand data concepts.

Course Outcomes:

On completion of this course students will be expected to –

1. **Define** data and its type. (BT level 1)
2. **Recall** the methods of collection of data. (BT level 1)
3. **Illustrate** various techniques of interview and interviewing. (BT level 2)
4. **Use** MS Excel for presentation of data- diagrams, graphs etc. (BT level 3)

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AECC - 1 (1ST SEMESTER)

AECC-1/Subject Name: Communicative English- I: Developing Oral Communication and Listening Skills

Course Objective:

The objective of the course is to introduce students to oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Course Outcomes:
On completion of this course students will be expected to -

- **Recall** Communication process, verbal, and non-verbal communication. (BT level 1)
- **Demonstrate** the skill of listening processes. (BT level 2)
- **Develop** a life skill on oral group communication like- group discussion, leadership skills, team management. (BT level 3)
- **Apply** the ABC of communication skill. (BT level 3)

AECC – 2 (1st Semester)

AECC-2/Subject Name: Behavioural Science - I

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes: On completion of this course students will be expected to -

1. **Define** self-identity and identity crisis. (BT level 1)
2. **Explain** self-esteem, personality traits, theories of learning etc. (BT level 2)
3. **Develop** foundation of individual behaviour. (BT level 3)
4. **Apply** a life skill on Time management. (BT level 3)

Semester – I (Generic Electives) (List -I)

Paper I/Subject Name: Microeconomics

Course Objectives:

This course is designed as generic elective course. It will help the students enrolled in other programmes to understand microeconomic principles.

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Course Outcomes:

On completion of this course students are expected to-

1. **Define** certain basic concepts like-definition of Economics, Subject matters, economic problems etc. (BT level 1)
2. **Explain** how to gauge consumer behaviour, convert desire into demand, create supply and strike equilibrium between the two. (BT level 2)
3. **Explain** economic use of scarce resources, their optimal use in different market conditions, price, and output determinations. (BT level 2)
4. **Apply** behavioural **knowledge** of utilizing scarce resources in their day-to-day life. (BT level 3).

Semester – I (Generic Electives) (List-2)
Paper I/Subject Name: Banking Practices **Subject Code: ECO182G102** **L-T-P-C – 3-0-0-3** **Credit Units: 3** **Scheme of Evaluation: Theory (70%) + Continuous Evaluation (30%)**

Course Objective:

The objective of the course is to introduce the students with the banking practices in India.

Course Outcomes:

On completion of this course students will be expected to:

- **Recall** - origin of banking system, functions of bank and its role in economic development of a country. (BT level 1)
- **Explain** the credit creation process and its limitations. (BT level 2)
- **Illustrate** components of balance sheet of a bank. (BT level 2)
- **Make use of** the knowledge of financial literacy to open various types of bank accounts. (BT level 3)

Semester – II
Paper I/Subject Name: Microeconomics-II

Course Objective:

The objective of the course is to introduce students to understand the behaviour of individuals and firms in allocation of scarce resources. It also enables the students to understand the structure of the market, factor pricing, and welfare economics.

Course Outcomes:

On completion of this course students are expected to-

1. **Recall** pricing theories of different market structure. (BT level 1)
2. **Illustrate** principles of welfare economics and measuring social welfare. (BT level 2)
3. **Interpret** the behaviour of excess demand and supply. (BT level 2)
4. **Explain** the behaviour of factor market and assess/predict it. (BT level 2)

Semester – II
Paper I/Subject Name: Macro Economics-II

Course Objective:

This course is designed as an extension of **Macro Economics-I** structured in semester-I. The prime objective of the course is to introduce behaviour of some macroeconomic variables like money, general price level, trade cycle etc. There is immense importance of role of value in macroeconomics. The student of economics must understand the role of the macro-economic variables in attaining stability in an economy.

Course Outcomes:

Students are expected to-

1. **Recall** the role of macroeconomic variables in maintaining stability in an economy. (BT level 1)
2. **Relate** macroeconomic variables to explain issues like price rise, unemployment, recession, and depression. (BT level 2)
3. **Illustrate** the behaviour of the trade cycle, which is very common in a market economy. (BT level 2)
4. **Analyse** some economic phenomena – like inflation, recession etc. (BT level 3)

Semester – II
Paper I/Subject Name: Quantitative Methods for Economics-II

Course Objective:

This course is correlated with the **Quantitative Methods in Economics-I** structured in semester-I. This course has been basically designed to impart knowledge of application of mathematics in Economics. Now a day, Explanation of economic principles, laws and theories has become mathematic-centric. So, a student must have sufficient knowledge of mathematical tools which very intensely used to explain the behaviour of economic variables.

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Course Outcomes:

Students are expected to-

1. **Recall** mathematical tools in explaining and understanding the behaviour of economic variables. (BT level 1)
2. **Explain** optimization techniques. (BT level 2)
3. **Solve** the problems relating to changing behaviour of economic variables under static as well as dynamic equilibrium. (BT level 3)
4. **Appraise** the art of logical inference and decision making. (BT level 3)

Semester – II

Paper I/Subject Name: Data Collection and Analysis-II

Course objectives:

This is a skill enhancement course for data collection techniques and analysis. The students will be given hands on training on using statistical and computing software to better visualize and understand data concepts.

Course Outcomes:

After competition of the course learners will-

1. **Recall** the methods of data collection. (BT level 1)
2. **Develop** Questionnaire. (BT level 2)
3. **Make use** of organization and visual representation of data. (BT level 3)
4. **Apply** sampling techniques as a tool of research. (BT level 3)

AECC – 3 (2NDSEMESTER)

AECC-1/Subject Name: Communicative English- II: Conversation and Public Speaking

Course Objective: The objective of the course is to give students a platform to enhance their speaking and conversational skills in English by engaging them in meaningful discussions and interactive activities.

Course Outcomes:

On completion of this course students are expected to -

1. **Recall** the technicalities of good conversations. (BT level 1)
2. **Demonstrate** good conversation. (BT level 2)
3. **Develop** enhanced personality and become assertive. (BT level 3)

AECC-4 (2nd Semester)

AECC-4/Subject Name: Behavioural Science - II

Course objectives: This course is designed toincrease one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations

Course Outcomes:

On completion of this course students will be expected to -

1. **Relate** culture and personality. (BT level 1)
2. **Explain** personal and organizational values. (BT level 2)
3. **Demonstrate** leadership. (BT level 2)
4. **Develop a life skill** on motivation. (BT level 3)

Semester – II (Generic Electives) (List -I)

Paper I/Subject Name: Macro Economics

Course Objective: This course is designed to introduce students to the basics of national income and its determination, output, and employment, working of multiplier, business cycle, inflation, and its causes.

Course Outcomes:

On completion of this course students will be expected to

1. **Define** and **understand** working of Macroeconomic variables. (BT level 1)
2. **Relate** working of multiplier and MPC. (BT level 1)
3. **Illustrate** the methods of estimating national income. (BT level 2)
4. **Identify** factors causing inflation. (BT level 3)

Semester – II (Generic Electives) (List-2)

Paper I/Subject Name: Fundamentals of Financial Economics

Course Objective: The objective of the course is to introduce students to understand principles of measuring risk and return

Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** market valuation of bond and equity stock. (BT level 1)
2. **Define** risk, its components and risk management. (BT level 1)
3. **Classify** the derivative market. (BT level 2)
4. **Explain** theories relating to banking performance, market, and interest risks of banks and about bank failure. (BT level 2)

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Semester – III

Paper I/Subject Name: Public Finance - I

Course Objective: This course is designed to introduce students about the subject matter of public Finance with special reference to India.

Course Outcomes:

On completion of this course students are expected to-

1. **Recall** the mechanism of the Government finance. (BT level 1)
2. **Differentiate** between public and private finance. (BT level 1)
3. **Explain** components public revenue and heads of public expenditure. (BT level 2)
4. **Illustrate** management of public debt with special reference to developing countries. (BT level 2)

Semester – III

Paper I/Subject Name: Statistical Methods

Course Objective: This course is designed to introduce students about statistical tools and its applications in economic analysis- formulating economic laws, economic policies, and in economic research.

Course Outcomes:

On completion of this course students will be expected to

1. **Recall** the methods of computing averages and dispersion. (BT level 1)
2. **Explain** basics of survey techniques, probability etc. (BT level 2)
3. **Solve** the problems of correlation among different variables and its interpretations. (BT level 3)
4. **Infer** the trend line. (BT level 4)

Semester – III (DSE)

Paper I/Subject Name: Money and Banking

Course Objective: The objective of the course is to introduce students about theories and functioning of the monetary and financial sectors of the economy. It highlights the organization, structure and role of financial markets and institutions.

Course Outcomes:

On completion of this course students are expected to:

1. **Recall** the evolution of money and its functions. (BT level 1)
2. **Explain** the role money demand and money supply in determining the rate of interest. (BT level 2)
3. **Illustrate** functioning of a bank and banking practices. (BT level 2)
4. **Relate** monetary policies formulated by the government and economic development. (BT level 2)

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Semester – III (DSE)

Paper I/Subject Name: Demography

Course Objective: The study of **demography** is of immense importance to an economy. Population studies help us to know how far the growth rate of the economy is keeping pace with the growth rate of population. The objectives of the course are to introduce students to achieve knowledge about size, composition, organization, and distribution of population and also to understand theories of population.

Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** different theories of population. (BT level 1)
2. **Classify** the components of distribution of population. (BT Level 2)
3. **Solve** problems of predicting population growth and other vital statistics. (BT level 3)
4. **Develop** research projects on Population Distribution and issues of Migration. (BT level 3)

Semester – III (Generic Electives)

Paper I/Subject Name: Public Finance

Course Objective: The objective of the course is to introduce students to about government finance with special reference to India. It investigates different components of government finance- like public revenue and public expenditure.

Course Outcomes:

On completion of this course students will be expected to

1. **Recall** the mechanism of the Government finance. (BT level 1)
2. **Differentiate** between public and private finance. (BT level 2)
3. **Illustrate** components of public revenue and components of public expenditure. (BT level 2)
4. **Explain** management of public debt with special reference to developing countries. (BT level 2)

Semester – III (SEC)

Paper I/Subject Name: Financial Economics

Course Objective: The objective of the course is to introduce students to understand principles of measuring risk and return

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Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** market valuation of bond and equity stock. (BT level 1)
2. **Define** risk, its components and risk management. (BT level 1)
3. **Classify** the derivative market. (BT level 2)
4. **Apply** the knowledge as a life skill. (BT level 3)

Semester – IV

Paper I/Subject Name: Public Finance
Subject Code: ECO182C401
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory – Semester End Examination (70%) + Continuous Evaluation (30%)

Course Objective: The objective of the course is to introduce students to about government finance with special reference to India. It investigates different components of government finance- like public revenue and public expenditure. This is designed as an extension of **Public Finance-I** structured in semester-III.

Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** the mechanism of the Government finance. (BT level 1)
2. **Explain** taxation policies and their role in economic analysis. (BT level 2)
3. **Illustrate** Fiscal policies and its role in economic development of a nation. (BT level 2)
4. **Summarise** functions of Finance Commission and importance public utility services. (BT level 2)

Semester – IV

Paper I/Subject Name: Introductory Econometrics

Course Objective: Econometrics is the use of statistical techniques to understand economic issues and test theories. Without evidence, economic theories are abstract and might have no bearing on reality. Econometrics is a set of tools we can use to confront theory with real-world data. It provides the tools to enable the students to extract useful information about important economic policy issues from available data.

Course Outcomes:

On completion of this course students will be expected to:

1. **Define** the basic concepts of relating to estimation of parameters and testing of hypotheses (BT level 1)
2. **Illustrate** methods regression analysis of economic data. (BT level 2)
3. **Develop** elementary procedures for model validation in the single equation context. (BT level. (BT level 3)
4. **Make use of** econometric tools in problem solving. (BT level 3)

Semester – IV

Paper I/Subject Name: Financial System

Course Objective: The objective of the course is to introduce students the Indian Financial system- its constituents, financial market-its types and functions, financial institutions and their services.

Course Outcomes:

On completion of this course students will be expected to:

1. **Classify** the structure of Indian financial system of India.
2. **Explain** the functions of money and capital markets.
3. **Develop** their problem-solving capacity to various finance related queries.
4. **Explain** the mechanism of digital banking system.

Semester – IV

Paper I/Subject Name: Agriculture and Resource Economics

Course Objective:

The objective of the course is to introduce students to know about role agriculture and farming in economic development of a nation.

Course Outcomes:

On completion of this course students will be expected to:

1. **Relate** agriculture and industry linkage and its interaction. (BT level 1)
2. **Recall** production theories of agriculture. (BT level 1)
3. **Explain** the principles of resource allocation. (BT level 2)
4. **Identify** issues relating to agriculture sector in a developing country. (BT level 3)

Semester – IV(SEC)

Paper I/Subject Name: Budgeting and Union Budget Analysis

Course Objective: The objective of the course is to introduce students to know about role budgeting in economic development of a nation.

Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** the process of preparation of Budget of an economy. (Bt level 1)
2. **Explain** how a govt. budget is implemented. (BT level 2)
3. **Appraise** a Govt. budget. (BT level 3)

Semester – IV(Generic Elective)
Paper I/Subject Name: Indian Economy

Course Objective: The objective of this course is to equip the students with a good understanding of India's economic problems.

Course Outcomes:

On completion of this course students will be expected to:

1. **Recall** composition, trend and methods of estimating national income in India. (BT level 1)
2. **Summarise** role, nature and issues relating to agriculture and industrial sector in India. (BT level 2)
3. **Explain** problems of MSME sector and PSEs of India. (BT level 2)
4. **Illustrate** LPG policies, achievements and failures of five year plans in India, and traditional functions of the RBI. (BT level 2)

5th Semester

Semester – V (Core Courses)
Paper I/Subject Name: Indian Economy

Course Objective:

The objective of the course is to

- Introduce students to major trend in economic indicators in India.
- Introduce Policy Measures
- Challenges of the economy.

Course Outcomes:

On completion of this course students will be expected to

- **Recall** features of Indian Economy
- **Understand** trends of the economy
- **Explain** Challenges and policy measures of Indian economy.

Semester – V (Core Courses)
Paper I/Subject Name: Development Economics

Course Objective:
The objectives of the course are to introduce students the indicators of economic development, theories of growth and development. Economic development is a process of targeted activities and programs that work to improve the economic wellbeing and quality of life of a community. This course is designed to introduce the theories of economic growth and development.

Course Outcomes:
On completion of this course students will be expected to

1. **Recall** the growth theories of an economy.
2. **Understand** the complex relations among the economic variables.
3. **Explain** strategies development.

Semester – V (DSE)
Paper /Subject Name: Welfare Economics

Course Objective:

The objective of the course is to introduce students to theories and principles relating to welfare economics.

Course Outcomes:
On completion of this course students will be expected to

- **Recall** origin of welfare economics
- **Understand** Peroto optimality and its role economic analysis.
- **Explain** modern Theories given by Kaldor, Hicks and Scitovosky
- **Estimate** externalities, social cost, and its calculation.

Semester – V (DSE)
Paper /Subject Name: Assam and North-east Economy

Course Objective:
The objectives of the course are to introduce students the economic issues of Assam and north-east Economy. It is important for the students to study their own economy at local level. Thus, this course will enable the students of Economics to know about their local economy-description, issues, economic development, availability of resources etc.

Course Outcomes:

On completion of this course students will be expected to:

- **Recall** economic history of Assam and North-East.
- **Understand** about economic challenges of this region.
- **Prepare** a comparative study of Northeast economy with the nation as a whole.

Semester – V (DSE)
Paper /Subject Name: Human Resource Management

Course Objective:

The objectives of the course is to introduce students to understand issues relating to human resource development.

Course outcome:

On completion of this course students will be expected to:

- **Recall** the Approaches o human resource management.
- **Understand** planning of man-power and HDI
- **Recall** methods of selection procedure of employees, absenteeism, rewards and incentives.

Semester – V (DSE)
Paper /Subject Name: Indian Economy- Pre-Independence Period

Course Objective:

The objective of the course is to enable students to have knowledge of the scenario of Indian economy during colonial rule.

Course Outcomes:

On completion of this course students will be expected to learn

- **Recall** background of Indian economy within the colonial period
- **Understand** change of agrarian structure.
- **Explain** nature of industrialization during British period

Semester – VI (Core Courses)
Paper /Subject Name: International Economics

Course Objective:

International economics is a field concerned with economic interactions of countries and effect of international issues on the world economic activity. It studies economic and political issues related to international trade and finance. The objective of the course is to introduce students to International Economics as a distinct branch of economics.

Course Outcomes:

On completion of this course students will be expected to:

- **Recall** theories of international economics, international dependence and flow of goods and services.
- **Understand** terms of trade, gains from trade etc. which are essential to evaluate international market, the structure of Balance of Payments, flow of funds, foreign exchange etc.
- **Compare** difference between free trade and protectionist.

Semester – VI (Core Courses)
Paper /Subject Name: Environmental Economics

Course Objective:

Environmental economics is a subset of economics concerned with the efficient utilization of resources. Because the environment provides both direct value and the raw material intended for economic activity, the environment and the economy are interdependent. For that reason, the way the economy is managed can have an impact on the environment that, in turn, may affect both welfare and the performance of the economy. The objective of the course is to introduce students to concepts, methods and policy options in managing the environment using tools of economic analysis.

Course Outcomes:

On completion of this course students will be expected to-

- **Relate** relationship between economics and issues of the environment.
- **Understand** the concept of sustainable development, its issues and policy measures relating to it.

Semester – VI (DSE)
Paper /Subject Name: Applied Econometrics

Course Objective:

Econometrics is the use of statistical techniques to understand economic issues and test theories. Without evidence, economic theories are abstract and might have no bearing on reality. Econometrics is a set of tools we can use to confront theory with real-world data. It provides the tools to enable the students to extract useful information about important economic policy issues from available data.

Course Outcomes:

On completion of this course students will be expected to-

- **Understand** the advanced Econometric theories.
- **Use** econometric tools in decision making.
- **Explain** the correlation between mathematical concepts and econometric theory.

Semester – VI (DSE)
Paper /Subject Name: Economics of Health and Education

Course Objective:

It is essential to understand the relationship between health and education and its effects on economic development in the developing world. Human Capital in its broadest sense encompasses the levels of education, health, and nutrition of the population. Few processes are as intertwined with development as human capital accumulation. Education increases productivity, speeds technological advancements, and increases the probability of more healthy productive children, all of which promotes economic development.

The primary objective of the course is to introduce students to understand economics of health and education sectors.

Learning Outcomes:

On completion of this course students will be expected to:

- **Learn** about economic foundation of health and education sectors.
- **Understand** the role investment in human capital formation and its impact on economic development of an economy.

Semester – VI (DSE)
Paper /Subject Name: History of Economic Thought

Course Objective:

History of Economic Thought as the title implies deals with the origin and development of economic ideas and their interrelations. It is a historical account of economic doctrines. The prime objective of the course is to introduce the students the development and evolution of economic theories in the world.

Course Outcomes:

On completion of this course students will be expected to-

- **Recall** different schools in the process of developing economic theories and principles.
- **Compare** of different ideas. It will enable a person to have a well-balanced and reasonable judgement.

Semester – VI (DSE)
Paper /Subject Name: Labour Economics

Course Objective:

The study of labor economics seeks to understand the relationship between workers and employers. It's important to society as it determines wages, the causes of discrimination, the impact of migration on employment, and how governments should manage recessions. The objective of the course is to introduce students to understand theories relating to labour.

Course Outcomes:

On completion of this course students will be expected to:

5. Learn about unemployment- its causes and types.
6. Learn about role of trade unions in determining wage rate.
7. Learn about the status of discrimination, impact of migration and social security of labour.

Semester – VI (DSE)
Paper /Subject Name: Industrial Economics

Course Objective:

The objective of the course is to introduce students to theories of firms and industries.

Course Outcomes:

On completion of this course students will be expected to:

- **Recall** theories of firm
- **Understand** various issues of investment.
- **Explain** how technical change and market structure can influence industrialization.

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Semester – VI (DSE)
Paper /Subject Name: Advanced Microsoft Excel

Course Objective:

Microsoft Excel is one of the most used products of Microsoft office. It is used for data entry, data analysis, data presentation, or calculation. The best thing about Microsoft Excel is that this totally depends on your skill level. You can use MS Excel for any beginner or advanced level task it will be equally efficient & easy to use in either case.

This MS Excel course is Advance Level or Expert Level training especially for **engineers, data analysts, data scientists, students, teachers, or researchers**, or for anyone who has basic or intermediate level Microsoft Excel knowledge & now wants to learn Advance Level, MS Excel.

Course Outcomes:

On completion of this course students will be expected to:

- Use of Pivot Tables & Charts
- **Understand** how to analyse data.
- **Learn** how to import & consolidate the data.
- **Learn** about Charts & Tables

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

(Royal School of Applied and Pure Sciences)
(Department of Chemistry)

Learning Outcomes based Curriculum Framework (LOCF)

For

M.Sc. Chemistry

SYLLABUS

&

COURSE STRUCTURE

SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Physical Chemistry I		Subject Code: CHY014C101
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Physical Chemistry I** are:

- To provide the concepts of thermodynamics and its applications to physical and chemical systems
- To enable the students to understand the phase rule and its application to three component systems
- To provide the basic understanding of statistical thermodynamics
- To provide the fundamental concepts of theories of ion-solvent interactions

Course Outcomes:

The student will

- be able to get the concepts of non-ideal solutions, fugacity, activity, fugacity coefficients, activity coefficients, non-equilibrium thermodynamics etc.
- be able to understand the concepts of statistical thermodynamics such as properties of independent particles, partition function, principles of equipartition etc.
- be able to know about the ion-solvent interactions, non-structural approach by Born model and structural approach by Bernal Flower model, methods to determine hydration number, Debye-Hückel theory.

SYLLABUS (1ST SEMESTER)

Paper II/Subject Name: Organic Chemistry I		Subject Code: CHY014C102
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of this course are:-

- To provide the basic theory of reaction kinetics
- To cover the stereo chemical and conformational aspect of molecules
- To throw some lights on bonding of molecules
- To clear the concept of bond formation and bond breaking

Course outcomes:

Students will

1. learn about kinetics of organic reactions
2. have information about three dimensional orientation of molecules and its effect on molecular reactivity
3. have some idea about bonding of molecules
4. develop concept about strategy of a new reaction .

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SYLLABUS (1ST SEMESTER)

Paper II/Subject Name: **Quantum Chemistry**		Subject Code: **CHY014C103**
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Quantum Chemistry** are

- To provide the basic principles and topics of quantum chemistry.
- To apply the fundamental postulates in solving different problems in quantum mechanics.
- To discuss the concept of formation of molecular orbitals.

Course Outcomes:

The students will

1. understand and use the terminology and nomenclature in quantum chemistry and topics discussed in the course.
2. be able to understand the basic concepts in quantum mechanics, atomic and molecular structure.
3. understand elementary numerical procedures and the basic relationships of quantum mechanics and molecular systems.

SYLLABUS (1ST SEMESTER)

Paper IV/Subject Name: **Inorganic Chemistry Laboratory**		Subject Code: CHY014C114
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (P)

Objective: The objectives of **Inorganic Chemistry Laboratory** are

- To provide knowledge of inorganic chemistry in scientific and technological aspects
- To help students in the development of curiosity and interest in inorganic chemistry
- To improve the understanding of the concepts and application of inorganic chemistry since the practical course is in relevance to the theory courses

Course Outcomes:

The student will

- be able to know the techniques that are useful in modern inorganic chemistry field.
- be able to develop analytical abilities for independent thinking.

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SYLLABUS (1ST SEMESTER)

Paper DSE I/Subject Name: Analytical Chemistry		Subject Code: CHY014D101
L-T-P-C – 4-0-0-4 (T)	Credit Units: 4	Scheme of Evaluation:

Objective: The objectives of **Analytical Chemistry** are

- To provide a thorough background in those chemical principles those are particularly important to analytical chemistry
- To provide the knowledge of terms, facts, concepts, techniques and principles of the subject and to develop the ability to apply skills in the proper handling of apparatus and different chemicals
- To develop problem solving skills

Course Outcomes:

The student will

- be able to know those laboratory skills that will give students confidence in their ability to obtain high quality analytical data.
- be able to develop an appreciation for difficult task of judging the accuracy and precision of experimental data.
- be able to knowthe techniques that are useful in modern analytical Chemistry.

SYLLABUS (1ST SEMESTER)

Paper DSE II/Subject Name: Food and Nutrition Chemistry		Subject Code: CHY014D102
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Food and Nutrition Chemistry** are

- To help students in the development of curiosity and interest in the subject
- To help students to understand biological need of different foods
- To provide the students the fundamental concepts required to rationalise and predict the nutrition value of foods

Course Outcomes:

The student will

- Be able to understand the different theory of nutrition of human body.
- Be able to know the fundamental concepts of food science.
- Be able to apply the knowledge in food technology.

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Physical Chemistry-II		Subject Code: CHY014C201
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Physical Chemistry-II** are

- To study the reaction mechanism, theories of reaction rate, kinetic and thermodynamic control of reactions
- To acquire the knowledge of catalyst and adsorption phenomena
- To understand the properties of polymers and techniques involved in polymerization.

Course Outcomes:

The students will

1. be able to understand reaction kinetics, theories of reaction rate and reaction mechanisms.
2. be able to understand the mechanisms of catalysis and properties of different catalysts.
3. be able to explain the adsorption of gases on solid and liquid surfaces.
4. be able to define colloids and micelles and can explain their properties.
5. know the mechanism of polymerizations and different techniques involved in polymerization.

SYLLABUS (2nd SEMESTER)

Paper II/Subject Name: Inorganic Chemistry I		Subject Code: CHY014C202
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Inorganic Chemistry I** are

- To provide an understanding of the details of molecular orbital theory of homo and hetero nuclear diatomic and polyatomic molecules
- To get details of weak chemical forces with special emphasis on hydrogen bonding and Van der Waal's forces
- To provide a detailed discussion of structure and properties of coordination compounds
- To provide an elaborated discussion on non-transition elements including preparation, properties, bonding and structure of some important compounds
- To put light on acid-base and redox chemistry

Course Outcomes: The students will

1. be able to understand the detailed idea of molecular orbital theory of homo and hetero nuclear diatomic and polyatomic molecules.
2. be able to know the details of weak chemical forces including hydrogen bonding Van der Waal's forces.
3. be able to get the details of structure and properties of coordination compounds by using valence bond theory and molecular orbital theory.
4. be able to know the chemistry of non transition elements and preparation, properties, bonding and structure of some non transition elements of importance.
5. be able to get the idea of acid-base chemistry with special emphasis on HSAB concept.
6. know the details of redox chemistry and their application.

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SYLLABUS (2nd SEMESTER)

Paper III/Subject Name: Spectroscopy-I		Subject Code: CHY014C203
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Spectroscopy-I** are

- To provide a thorough background those are particularly important to analytical chemistry
- To provide the knowledge, techniques and principles of spectroscopy and to develop the ability to apply skills in the proper handling of apparatus
- To develop problem solving skills

Course Outcomes:

The student will

- be able to know those laboratory skills that will give students confidence in their ability to obtain high quality analytical data.
- be able to develop an appreciation for difficult task of judging the accuracy and precision of experimental data.
- be able to know the techniques that are useful in modern analytical Chemistry.
- learn about application of Spectroscopy.

SYLLABUS (2nd SEMESTER)

Paper IV/Subject Name: Organic Chemistry Laboratory		Subject Code: CHY014C214
L-T-P-C – 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)

Objective: The objectives of **Organic Chemistry Laboratory** are

- To provide knowledge of organic chemistry in scientific and technological aspects
- To help students in the development of curiosity and interest in organic chemistry
- To improve the understanding of the concepts and application of organic chemistry since the practical course is in relevance to the theory courses

Course Outcomes:

The student will
be able to know the techniques that are useful in modern applied chemistry field.

- be able to develop analytical abilities for independent thinking.
- be able to do the functional group analysis of simple organic compounds and to synthesize different derivatives of simple organic molecules.

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SYLLABUS (2nd SEMESTER)

Paper DSE I/Subject Name: Biochemistry		Subject Code: CHY014D201
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of this course are:-

1) Information about living systems in terms of Chemistry
2) Knowledge about chemical reactions happening in biological systems

Course outcomes:

Students will learn

1. about the application of Chemistry in biological system
2. Effect of Biology-Chemistry interaction on living organisms.

SYLLABUS (2nd SEMESTER)

Paper DSE II/Subject Name: Chemistry of Macromolecules		Subject Code: CHY014D202
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Chemistry of Macromolecules** are

- to provide the idea of macromolecules, their structure and properties
- to provide the knowledge of commercial polymers and processing of macromolecules

Course Outcomes:

The students will

1. be able to understand basics and configurations of macromolecules.
2. be able to explain about commercial polymers and processing of macromolecules

SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Organic Chemistry II		Subject Code: CHY014C301
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of this course are:-

1. To provide the synthetic methodology of organic compounds
2. To cover the reagents used in organic synthesis
3. To throw some lights on rearrangement reactions
4. To discuss about Organometallic reactions

Course outcomes:

Students will

1. learn about synthetic methods
2. have information about reagents
3. have some idea about construction of a new reaction

develop concept about metal-organic

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SYLLABUS (3rd SEMESTER)

Paper II/Subject Name: Inorganic Chemistry II		Subject Code: CHY014C302
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Inorganic Chemistry II** are

- To provide an understanding of the details of inorganic reaction mechanism by giving emphasis on substitution reaction, electron transfer reaction and photochemical reactions
- To get details of spectral and magnetic properties of coordination compounds
- To provide a detailed discussion of organmetallic compounds including their bonding and properties
- To provide an elaborated discussion on organometallic reactions and catalysis
- To get details of chemistry of lanthanides and actinides

Course Outcomes:

The students will

1. be able to understand the details of inorganic reaction mechanism by giving emphasis on substitution reaction, electron transfer reaction and photochemical reactions.
2. know how to analysis the spectral and magnetic properties of coordination compounds.
3. be able to get detailed idea of organmetallic compounds including their bonding and properties.
4. be able to have a view of an organometallic reactions including oxidative addition and reductive elimination, insertion and elimination reactions
5. be able to understand the basics of organometallic catalysis.
6. know details of chemistry of lanthanides and actinides.

SYLLABUS (3rd SEMESTER)

Paper III/Subject Name: Physical Chemistry Laboratory		Subject Code: CHY014C313
L-T-P-C – 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)

Course Outcomes

1. be able to handle different instruments important in physical and material sciences.
2. be able to get the detailed concepts of kinetics of different reactions, autocatalytic reaction and volumetric chemical analysis by doing iodometric titration.
3. be able to understand the applications of conductivity, pH-metry and spectrophotometry.

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SYLLABUS (3rd SEMESTER)

Paper DSEI /Subject Name: Chemical Kinetics and Electrochemistry **Subject Code: CHY014D301**

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The objectives of **Chemical Kinetics and Electrochemistry** are

- To study the details of kinetics of fast reactions, unimolecular reaction and reaction in solutions
- To acquire the knowledge of photochemical reactions and kinetics of different photochemical reactions.
- To understand the theories of electrical interface and different electrochemical methods used in electrode kinetics

Course Outcomes:

The students will

1. be able to understand different techniques used to study fast reactions.
2. be able to understand the kinetics of unimolecular reactions.
3. be able to explain the kinetics of reactions in solutions.
4. be able to acquire knowledge of different photochemical reactions
5. know the theories of electrical interface and electrochemical methods used in electrode kinetics

SYLLABUS (3rd SEMESTER)

Paper DSE II /Subject Name: Heterocyclic Compounds and Natural products
Subject Code: CHY014D302

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The objectives of **Heterocyclic Compounds and Natural products** are

1. To provide the synthetic methodology of heterocyclic compounds
2. To cover the heterocyclic reagents used in organic synthesis
3. To throw some lights on the use of heterocyclic compounds
4. To understand the importance and application of natural products
5. To help students to understand the structure and reactions of biological molecules

Course Outcomes:

The student will

- learn about synthetic methods involving heterocyclic chemistry.
- have information about heterocyclic reaction.
- have some idea about construction of reaction using heterocyclic compounds.
- be able to know the fundamental concepts of biological molecules.
- develop the fundamental concepts to predict the structure of an unknown drug.

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SYLLABUS (3rd SEMESTER)

Paper DSE III /Subject Name: **Bio-inorganic Chemistry**		Subject Code: CHY014D303
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Bioinorganic Chemistry** are

- To provide an understanding of scope of bioinorganic chemistry.
- To provide an emphasis on biochemistry of iron.
- To put light on chemistry of metalloenzymes.
- To cover the idea of metals in medicine

Course Outcomes:

The students will

1. be able to understand the detailed idea of scope of bioinorganic chemistry..
2. be able to know the details of biochemistry of iron.
3. be able to get an idea of chemistry of mealloenzymes.
4. be able to get details of metals in medicine.

SYLLABUS (3rd SEMESTER)

Paper DSE IV /Subject Name: **Supramolecular Chemistry**		Subject Code: CHY014D304
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Supramolecular Chemistry** are:

- To provide the methodology of synthesis and characterization of macromolecular materials
- To throw some lights on synthetic strategies of Dendrimers
- To discuss about Principles of molecular association and organization.

Course outcomes:

Students will

- learn about synthetic methods of supramolecules
- have information about Dendrimers
- have some idea about molecular recognition
- develop concept about host-guest assembly and supramolecular assembly.

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SYLLABUS (3rd SEMESTER)

Paper DSE V /Subject Name: Spectral Techniques in Inorganic Chemistry		Subject Code: CHY014D305
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Spectral Techniques in Inorganic Chemistry** are

- To provide a detail idea of application of NMR and EPR to inorganic chemistry
- To provide an emphasis on CD/ORD, NQR and Mossbauer.
- To put light on Raman, Mass, PES, ESCA, IR and EPR

Course Outcomes:

The students will

1. be able to understand the detailed concept application of NMR and EPR to inorganic chemistry.
2. be able to know the details of CD/ORD , NQR and Mossbauer.
3. be able to get an idea of Raman, Mass, PES, ESCA, IR and EPR.

SYLLABUS (3rd SEMESTER)

Paper DSE VI /Subject Name: Computer in Chemistry		Subject Code: CHY014D306
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Computer in Chemistry** are

- to provide the idea of applications of computer to solve different chemical problems

Course Outcomes:

The students will

1. be able to understand about FORTRAN programming and construction of different algorithms
2. be able to apply the computer programming in chemical problems.

SYLLABUS (4th SEMESTER)

Paper I /Subject Name: Environmental & Green Chemistry		Subject Code: CHY014C401
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objectives of **Environmental & Green Chemistry** are:

- To provide the knowledge of major pollutants
- To discuss different ways of Control of air, water and soil pollutions
- To discuss about principles and methodologies of green chemistry

Course outcomes:

Students will

- learn about major air pollutants, effects of air pollution synthetic methods
- have information about metal toxicity
- have some idea about waste water treatment processes
- develop concept of green chemistry

SYLLABUS (4th SEMESTER)

Paper II /Subject Name: Spectroscopy-II		Subject Code: CHY014C402
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objectives of **Spectroscopy-II** are

- To provide a thorough background those are particularly important to analytical chemistry
- To provide the knowledge, techniques and principles of spectroscopy and to develop the ability to apply skills in the proper handling of apparatus
- To develop problem solving skills

Course Outcomes:

The student will

- be able to know those laboratory skills that will give students confidence in their ability to obtain high quality analytical data.
- be able to develop an appreciation for difficult task of judging the accuracy and precision of experimental data.
- be able to know the techniques that are useful in modern analytical Chemistry application of Spectroscopy.

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SYLLABUS (4th SEMESTER)

Paper DSE I /Subject Name: Advanced Quantum Chemistry		Subject Code: CHY014D401
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objectives: The objectives of **Advanced Quantum Chemistry** are

- to provide the idea about approximation methods of quantum chemistry and electronic structure of many electron atoms
- to discuss about different theorems of quantum mechanics
- to know details of semi-empirical methods and density functional theory

Course Outcomes:

The students will

1. understand about the approximate methods for quantum chemical treatment of many electron system
2. be able to understand different theorem in molecular quantum mechanics
3. be able to know about semi empirical methods and brief idea about density functional theory

SYLLABUS (4th SEMESTER)

Paper DSE II /Subject Name: **Catalysis and Surface Chemistry**		Subject Code: CHY014D402
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (P)

Objective: The objectives of **Catalysis and Surface chemistry** are

- To know about the mechanisms of kinetics of heterogeneous catalysis
- To acquire the knowledge of zeolites and clay and their uses as heterogeneous catalyst
- To understand the properties of liquid-solid interface of surface chemistry
- To understand different techniques used in surface characterization

Course Outcomes:

The students will

1. be able to understand reaction kinetics of heterogeneous catalysis.
2. be able to know about the properties of zeolites and clays and their industrial applications.
3. be able to explain surface phenomenon of solid-liquid interface.
4. be able to different techniques used in surface characterizations.

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SYLLABUS (4th SEMESTER)

Paper DSE III /Subject Name: **Medicinal Chemistry**		Subject Code: CHY014D403
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Medicinal Chemistry** are

- To help students in the development of curiosity and interest in Medicinal Chemistry
- To help students to understand the structure and reactions of biological molecules
- To provide the students the fundamental concepts required to rationalise and predict the structure of an unknown drug

Course Outcomes:

The student will

- be able to understand the drug targets and enzyme inhibition.
- be able to know the fundamental concepts of Pharmacodynamics and Pharmacokinetics.
- be able to apply the knowledge in Drug Discovery and Design.
- be able to understand the factors affecting the different types of mechanisms of drugs.

SYLLABUS (4th SEMESTER)

Paper DSE IV /Subject Name: Organic Photochemistry and Pericyclic Reactions Subject Code: CHY014D404		
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Organic Photochemistry and Pericyclic Reactions** are

- To help students in the development of curiosity and interest in the subject
- To help students to understand the photochemical reactions of organic molecules
- To provide the students the fundamental concepts required to rationalise and predict the products of a pericyclic reaction

Course Outcomes:

The student will

- be able to understand the photo induced reaction.
- be able to know the fundamental concepts of pericyclic reaction.
- be able to apply the knowledge in synthetic methodology.

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SYLLABUS (4th SEMESTER)

Paper DSE V /Subject Name: **Chemistry of Materials**		Subject Code: CHY014D405
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Chemistry of Materials** are

- To provide an understanding of the basics of structure of atom and idea leading to the concept of atomic orbitals.
- To provide an emphasis on the periodic table and trend in periodic properties.
- To put light on chemical bonding concept including detailed discussion on ionic bonding and covalent bonding.
- To cover the idea of acid base concept and their various applications.

Course Outcomes:

The students will

1. be able to understand the detailed idea and structure of atom starting from basic idea including black body radiation up to Schrödinger's wave equation and orbital concept.
2. be able to know the details of periodic table and variation of different periodic properties across the modern periodic table.
3. be able to get an idea of chemical bonding including details of both ionic and covalent bonding
5. be able to get details of acid and base concept and their application in practical field

SYLLABUS (4th SEMESTER)

Paper DSE VI /Subject Name: **Organometallic Chemistry and catalysis**		
Subject Code: CHY014D406		
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Objective: The objectives of **Organometallic Chemistry** are

- To provide an understanding of the details of main group organometallic chemistry.
- To provide an emphasis on the metal-carbon σ- and π-bond
- To put light on syntheses and reactions of cyclopentadienyl and arene metal analogues
- To cover the idea of application of organometallic compounds to organic synthesis and catalysis.

Course Outcomes

The students will

1. be able to understand the detailed idea of main group organometallic compounds.
2. be able to know the details of the transition metal-carbon bond including both metal-carbon σ- and π-bond
3. be able to get an idea of syntheses and reactions of cyclopentadienyl and arene metal analogues
4. be able to get details of application of organometallic compounds to organic synthesis and catalysis.

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ROYAL GLOBAL UNIVERSITY
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(RSBSC)

Department of Biotechnology

SYLLABUS

&

COURSE STRUCTURE

M.Sc. in Biotechnology

W.E.F. 2022-23

The Assam Royal Global University IQAC Estd : 2018

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SYLLABUS (1ST SEMESTER)

Subject Name: Biochemistry	**Scheme of Evaluation: (T)**
Subject Code: BTC154C101	**Credit Units: 3-1-0-4**

Course Objective: The course is designed to understand the basic characteristics of various biological macromolecules, their formation along with their association in various metabolic pathways.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the core concept of basic biochemistry, structure of various biological macromolecules.	**BT 1**
CO 2	**Understand**the basic biochemical processes occurring in the living system and involvement of various biological macromolecules in those processes.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with biochemistry.	**BT 4**
CO 5	**Evaluate** their understanding in chemistry behind reactions occurring in living systems.	**BT 5**

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Subject Name: Genetics	Scheme of Evaluation: (T)
Subject Code: BTC154C102	Credit Units: 3-1-0-4

Course Objective: The course is designed with the following major objectives

The course is designed to understand the various laws governing inheritance and learn about chromosomal aberrations and structure of chromosomes

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic concept of Mendelian principles of heredity and use those principles to analyze genetic data.	**BT 1**
CO 2	**Understanding** of how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.	**BT 2**
CO 3	**Apply** to real life situations and one's life the principles of human heredity.	**BT 3**
CO 4	**Analyse** the historical and current knowledge regarding human heredity, and understand how such knowledge has influenced law, medicine, and society.	**BT 4**
CO 5	**Evaluate** the fundamentals of gene technology to understand how such technology impacts humans.	**BT 5**

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Subject Name: Microbiology	Scheme of Evaluation: (T)
Subject Code: BTC154C103	Credit Units: 3-1-0-4

Course Objective:

The course aims to give a holistic theoretical and practical knowledge in field of general microbiology, its core concept, scopes, applications and future prospects.

Course outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the core concept of basic microbiology, microbial structure, their taxonomic classification, microbial ecology and their applications.	**BT 1**
CO 2	**Understand** isolation, screening, characterization, and identification of important microbes from various sources.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with microbiology.	**BT 4**
CO 5	**Evaluate** future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: Practical I	Scheme of Evaluation:(P)
Subject Code: BTC154C114	Credit Units: 0-0-8-4

Course Objective:

The course is designed with an objective to give the students a wholesome practical knowledge on Microbiology, Genetics and Biochemistry.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the practical skills associated with Microbiology, Genetics and Biochemistry.	BT 1
CO 2	**Understand** isolation, screening, characterization, and identification of important microbes from various sources.	BT 2
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	BT 3
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with microbiology.	BT 4
CO 5	**Create** an understanding in expanding the future prospects by pursuing entrepreneurial ventures in this field.	BT 5

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Subject Name: DSE – 1 (Analytical Techniques)	Scheme of Evaluation: (T)
Subject Code: BTC154D101	Credit Units: 3-1-0-4

Course Objective:

The course is designed with an objective to give students the technical know how of the working of analytical equipment used in Biotechnology

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Remember** the specific technique to be used for different analytical characterizations.	BT 1
CO 2	**Understand** the working principles of various equipment used in analysis.	BT 2
CO 3	Ability to **apply** the acquired knowledge to address research problems.	BT 3
CO 4	Ability ti **analyse** the data generated by using sophisticated equipment.	BT 4
CO 5	Ability to **evaluate** alternative and better methods of sample analysis to reduce time and increase throughput.	BT 5

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SYLLABUS (2nd SEMESTER)

Subject Name: Biophysical Chemistry	**Scheme of Evaluation: (T)**
Subject Code: BTC154C201	**Credit Units: 3-1-0-4**

Course Objective:

The course aims to give a holistic theoretical and practical knowledge in field of basics of Biophysical Chemistry, its role in the life form, and techniques to understand various Biophysical phenomena in living system.

Course Outcome:

After completion of the course, the students are expected to

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the practical skills associated with Biophyscical Chemistry.	**BT 1**
CO 2	**Understand** molecular events associated with protein chemistry and basic principles associated with various instruments and techniques.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with biophysical chemistry.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: Cell Biology	**Scheme of Evaluation:(T)**
Subject Code: BTC154C202	**Credit Units: 3-1-0-4**

Course Objective: The course is designed with the following major objectives

The course aims to give a holistic theoretical and practical knowledge in field of general microbiology, its core concept, scopes, applications and future prospects.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Ability to**remember** how cellular components are used to generate and utilize energy in cells.	**BT 1**
CO 2	**Understand** the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles	**BT 2**
CO 3	**Apply** their knowledge of cell biology to selected examples of changes orlosses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.	**BT 3**
CO 4	**Analyse** the cell signalling and how it regulates cellular functions. Also how its disregulation leads to cancer and other diseases.	**BT 4**
CO 5	**Evaluate** the how cells grow, divide, and die and how these important processes are regulated.	**BT 5**

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Subject Name: Molecular Biology	Scheme of Evaluation: (T)
Subject Code: BTC154C203	Credit Units: 3-1-0-4

Course Objective: The course is designed to understand the organization of the prokaryotic/eukaryotic eukaryotic genome and the various molecular processes taking place in the living system

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Remember** the various molecular events associated with the growth and development of the cell.	BT 1
CO 2	**Understand** how replication, transcription and translation processes occur within the living cell.	BT 2
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	BT 3
CO 4	**Analyse** the effetcs of various factors on molecular events including replication, transcription and translation.	BT 4
CO 5	**Evaluate** the knowledge to design experiments to manipulate cellular and molecular processes.	BT 5

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Subject Name: Practical II	Scheme of Evaluation: (P)
Subject Code: BTC154C214	Credit Units: 0-0-8-4

Course Objective:

The course is designed with an objective to give the students a wholesome practical knowledge on Bio-instrumentation associated with Biophysical Chemistry, Molecular Biology and Cell Biology.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the practical skills associated with essential instrumentation and techniques, Molecular Biology and Cell Biology.	**BT 1**
CO 2	**Understand** the characterization and quantification of various biomolecules.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with microbiology.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: DSE – 2 (Genomics and Proteomics)	Scheme of Evaluation:(T)
Subject Code: BTC154D201	Credit Units: 3-1-0-4

Course objectives: The course is designed to appraise the students to the vital concepts of technologies pertinent to Genomics and Proteomics, their applications and demonstrate skills to apply the knowledge in scientific queries.

Course outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the various techniques involved in the study of genomics and proteomics.	**BT 1**
CO 2	**Understand** the basic principle of all the techniques associated with genomics and proteomics study.	**BT 2**
CO 3	**Apply** the knowledge in the study of genomics and proteomics of a cell under specific conditions.	**BT 3**
CO 4	**Analyse** the effect of various intrinsic and extrinsic factors in the genome and proteome of a cell under certain conditions	**BT 4**
CO 5	**Evaluate** better and alternative methods to analyse the sample in cost effective manner.	**BT 5**

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SYLLABUS (3rdSEMESTER)

Subject Name: Animal Biotechnology | **Scheme of Evaluation: (T)**

Subject Code: BTC154C301 | **Credit Units: 2-1-0-3**

Course Objective:

The course is designed to appraise the students to the vital concepts in animal cell culture, animal genomics and transgenic animals and their process of characterization of animal genomes.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the principles, practices, and application of animal biotechnology in Tissue Engineering, Vaccines and biopharmaceuticals.	**BT 1**
CO 2	**Understand** the principles of animal culture and media preparation.	**BT 2**
CO 3	**Apply** the animal tissue culture techniques and animal products, production & improvement of them	**BT 3**
CO 4	**Analyse** the cell and molecular techniques to in vitro situations.	**BT 4**
CO 5	**Evaluate** the importance of engineering animal cells to produce therapeutic proteins	**BT 5**

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Subject Name: Plant Biotechnology	Scheme of Evaluation: (T)
Subject Code: BTC154C302	Credit Units: 2-1-0-3

Course Objective:

The course is designed to understand the various processes involved in plants tissue culture and how the techniques learnt can help in the creation of new transgenics.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** about tissue culture, callus culture, suspension cell culture of plant tissues.	**BT 1**
CO 2	**Understand** the processes of creation of tissue cultured plants.	**BT 2**
CO 3	**Apply** the knowledge of plant tissue culture in conservation.	**BT 3**
CO 4	**Analyze** the theoretical knowledge in the generation of new plants.	**BT 4**
CO 5	**Evaluate** the knowledge gained in compiling the same for proposing solutions to plant diseases.	**BT 5**

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Subject Name: Practical III	Scheme of Evaluation: (P)
Subject Code: BTC154C313	Credit Units: 0-0-4-2

Course Objective:

The course is designed with an objective to give the students a wholesome practical knowledge on Bioprocess Technology, plant tissue culture, and the basics of animal cell culture.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the practical skills associated with essential instrumentation and techniques involved in fermentation, plant and animal tissue culture.	**BT 1**
CO 2	**Understand** the basic principles involved in the production of various fermentedproducts.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving reallife problems associated with microbiology.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: DSE – 3 (Environmental Biotechnology) **Scheme of Evaluation:(T)**

Subject Code: BTC154D301 Credit Units:3-1-0-4

Course Objective:

This course is offered with the objective of familiarizing students with the current and pertinent environmental issues and possible approaches to mitigate them.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** and identify area and time-specific environmental issues.	**BT 1**
CO 2	**Understand** the significance of environmental problems persisting in a place.	**BT 2**
CO 3	**Apply** the knowledge to relate cause and effect of major issues pertaining to the environment.	**BT 3**
CO 4	**Analyse** the scientific basis of the negative effects of pollutants on the environment.	**BT 4**
CO 5	**Evaluate** a detailed information system, starting from cause, effect, and solution to better prepare oneself to mitigate environmental concerns.	**BT 5**

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Subject Name: DSE – 4 (Bioprocess Technology)	Scheme of Evaluation: (T)
Subject Code: BTC154D302	Credit Units: 3-1-0-4

Course Objectives:

The course aims to give a holistic theoretical and practical knowledge in field of general microbiology, its core concept, scopes, applications and future prospects.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the core concept of modern biotechnology and its application in food, pharma- and petroleum industries.	**BT 1**
CO 2	**Understand** the production procedure of alcoholic beverages, antibiotics and drugs.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing practical solutions in solving real life problems associated with microbiology.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: DSE – 5 (Bioinformatics and Biostatistics)	Scheme of Evaluation:(T)
Subject Code: BTC154D303	Credit Units:3-1-0-4

Course Objectives:

The course aims to give a holistic theoretical and practical knowledge in field of bioinformatics and biostatistics to understand the various cellular activities.

Course outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the various softwares and biological databases and their application in the analysis of various biological experiments.	**BT 1**
CO 2	**Understand** the various softwares and their use in the analysis of various biological results.	**BT 2**
CO 3	**Apply** the knowledge to analyse the results of biological experiments statistically using various computational tools	**BT 3**
CO 4	**Analyse** the various biological events and their probable outcome using computationaltools .	**BT 4**
CO 5	**Evaluate** various databases and softwares for the experiments/ analysis of the results of biological experiments.	**BT 5**

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SYLLABUS (4thSEMESTER)	
Subject Name: Immunology	**Scheme of Evaluation: (T)**
Subject Code: BTC154C401	**Credit Units: 2-1-0-3**

Course Objective:

The course aims to give detailed concept in the core areas of immunology and understand the various forms of immunity and also the diseases associated with immune disorders.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the basic forms of immune system present in the body.	**BT 1**
CO 2	**Understand** the mechanism of the immune system.	**BT 2**
CO 3	**Apply** the knowledge learnt in relating the same to the defence of the body during diseases.	**BT 3**
CO 4	**Analyse** the importance of the various molecules that play an important role in immune function.	**BT 4**
CO 5	**Evaluate** the various diseases that occurs in the system to the forms of immune disorders.	**BT 5**

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Subject Name: Genetic Engineering	Scheme of Evaluation: (P)
Subject Code: BTC154C402	Credit Units: 2-1-0-3

Course Objective:

The course aims to give in depth knowledge in field of genes and genetic engineering, the mechanism of creation of recombinant products and the role of instrumentation and sequencing process in genetic engineering.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the core concept of Genetic Engineering, DNA modifying enzymes and cloning vectors *etc.*	**BT 1**
CO 2	**Understand** the production procedure of recombinant products by molecular cloning.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing biotechnological solutions in solving various problems.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject Name: Practical IV	Scheme of Evaluation: (P)
Subject Code: BTC154C413	Credit Units: 0-0-4-2

Course Objective:

The course is designed with an objective to give the students a wholesome practical knowledge on Genetic Engineering, Immunology, and Industrial Microbiology.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the practical skills associated with Genetic Engineering and Immunology.	**BT 1**
CO 2	**Understand** the characterization and quantification of DNA from various sources.	**BT 2**
CO 3	**Apply** the knowledge gained during the course in the field of research and development.	**BT 3**
CO 4	**Analyse** theoretical knowledge in developing and optimizing protocols for various experiments.	**BT 4**
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	**BT 5**

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Subject: DSE-6 (IPR, Biosafety, Bioethics and Research Methodology) Scheme of Evaluation: (T)

Subject Code: BTC154D401 Credit Units: 3-1-0-4

Course Objectives:

This subject aims to introduce students to Intellectual Property Rights and apprise them of ethical issues in the biological sciences and the laws pertaining to these in both the global and national context and also to aware the students with ethical practices appropriate for various scientific disciplines at all times and to adopt safe working practices relevant to the different biotech industries & fields of research.

Course outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** intellectual property laws/principles (including copyright, patents, designs and trademarks) to real problems and to analyse the social	BT 1
CO 2	**Understand**, recognize and distinguish an ethical issues from other issues	BT 2
CO 3	**Apply** the knowledge gained during the course in spreading IPR relatedawareness.	BT 3
CO 4	**Analyse** experimental results for their potential to file suitable IPR.	BT 4
CO 5	**Evaluate** their understanding in expanding their future prospects by pursuing entrepreneurial ventures in this field.	BT 5

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Subject Name: DSE-8 (Industrial Microbiology)	Scheme of Evaluation: (T)
Subject Code: BTC154D403	Credit Units: 3-1-0-4

Course Objectives:

The course is designed to provide knowledge in the field of industrially important microorganisms, their isolation and culture and development of new strains.

Course Outcome:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the utility of different industrial approaches to improvise microbial production.	**BT 1**
CO 2	**Understand** the principles of the various techniques used in food processing and fermentation technology.	**BT 2**
CO 3	**Apply** modern biotechnology in the food and pharma industries, for example, in the production of alcoholic beverages, antibiotics and other drugs.	**BT 3**
CO 4	**Analyse** experimental data generated using different processes.	**BT 4**
CO 5	Evaluate the design of fermenters and bioreactors to improve industrial production processes currently in use.	**BT 5**

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Subject Name: DSE – 9 (Developmental Biology)	Scheme of Evaluation:(T)
Subject Code: BTC154D404	Credit Units: 3-1-0-4

Course Objectives:

The main objective of the course is to gather information about the rich heritage of medicinal plants present in the region, gain knowledge on the the process of conservation of medicinal plants, their preservation and their applications.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Ability to **remember** the important developmental stages in organisms	**BT 1**
CO 2	Ability to **understand** the role of various genes involved in development.	**BT 2**
CO 3	Ability to **apply** the knowledge gained in carrying out studies on development.	**BT 3**
CO 4	Ability to **analyze** the importance of various processes involved in development of an organism	**BT 4**
CO 5	Ability to **evaluate** the role of germ layers, oogeneisis, gametogenesis and spermatogenesis	**BT 5**

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

Royal School of Engineering and Technology (RSET)

Department of Computer Science and Engineering (CSE)

Learning Outcome-based Curriculum Framework for

Undergraduate Programme in B. Tech (CSE)

W.E.F 2022-23

The Assam Royal Global University IQAC Estd. 2018

Director, IQAC
The Assam Royal Global University

1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Programme Educational Objectives (PEOs) are defined and developed for each program with the consultation and involvement of various stakeholders such as management, students, industry, regulating authorities, alumni, faculty and parents. Their interests, social relevance and contributions are taken in to account in defining and developing the PEOs. The Program Educational Objectives (PEOs) of the Computer Science and Engineering are listed below:

- **PEO1:** To provide students with a strong foundation in the Mathematical, Scientific and Engineering fundamentals necessary to formulate, solve and analyze engineering problems and to prepare them for graduate studies, R&D.
- **PEO2:** To provide exposure to emerging cutting-edge technologies, adequate training & opportunities to work as teams on multidisciplinary projects with effective communication skills and leadership qualities.
- **PEO3:** To prepare the students for a successful career for bridging the digital divide and meeting the requirements of Indian and multinational companies.
- **PEO4:** To promote student awareness on life-long learning and to introduce them to professional ethics and codes of professional practice.

2. PROGRAMME OUTCOMES (POs)

Programme Outcomes describe what students are expected to know or be able to do by the time of graduation from the CSE programme. POs are statements about the knowledge, skills and attitudes (attributes) the graduate of a formal engineering program should have. POs deal with the general aspect of graduation for a particular program, and the competencies and expertise a graduate will possess after completion of the program. The identified Pos are as follows:

- **PO1 - Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2 - Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3 - Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4 - Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5 - Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6 - The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7 - Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8 - Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9 - Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- **PO10 - Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11 - Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12 - Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological charge.

Computer Science and Engineering if he/she earns total credit of 166. A student will be eligible to get the degree with Honors, if he/she completes an additional 20 credits. These could be acquired through MOOCs or SWAYAM platforms.

DETAILED SYLLABUS OF 1ST SEMESTER

Paper I/Subject Name: Chemistry		Subject Code: CHY022C101
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Describe** and **understand** the ideas in thermodynamics, electrochemistry and their importance in engineering	BT 2
CO 2	**Develop** an ability to design, implement, and evaluate the results of experimentation using standard scientific methodologies such as	BT 3
CO 3	**Analyze** the combustion mechanisms of various fuels	BT 4

Paper II/Subject Name: Mathematics-I		Subject Code: MAT022C102
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the applications of differential and integral calculus in different fields of Engineering.	BT 2
CO 2	**Apply** the single and multivariable differential and Integral calculus in engineering problems.	BT 3

CO 3	**Analyse** and assess basis and dimension of vector spaces and their applications.	BT 4 & 5

Paper III/Subject Name: Chemistry Lab		**Subject Code: CHY022C111**
L-T-P-C – 0-0-2-1	**Credit Units: 01**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic techniques used in chemistry laboratory for small/large scale analyses/purification.	BT 2
CO 2	**Utilize** the fundamental laboratory techniques for analyses such as titrations, separation/purification, etc.	BT 3

Paper IV/Subject Name: Engineering Graphics & Design		**Subject Code: CEE022C117**
L-T-P-C – 1-0-4-3	**Credit Units: 03**	**Scheme of Evaluation: TP**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the dimension and figures using the drawing instruments and acquire visualisation skills, projection of points, etc.	BT 2
CO 2	**Utilize** engineering curves in tracing the paths of simple machine components.	BT 3
CO 3	**Analyse** and assess sketches to convert them to engineered drawings.	BT 4

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Paper V/Subject Name: Workshop Practices		Subject Code: MEE022C118
L-T-P-C – 1-0-4-3	Credit Units: 03	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the different manufacturing processes which are commonly employed in the industry	BT 2
CO 2	**Utilize** tools, instruments and techniques learnt to perform basic household chores in terms of house wiring, carpentry etc	BT 3
CO 3	**Experiment** using the tools and techniques learnt for various purposes and decide on the best prospect.	BT 4

Paper VI/Subject Name: Developing Oral Communication and Listening Skills		Subject Code: CEN982A101
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basics of written and oral communication.	BT 2
CO 2	**Apply** the concepts learnt in day-to-day life.	BT 3

Paper VII/Subject Name: Environmental Sciences-I		Subject Code: EVS982A103
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the importance of environmental studies and methods of conservation of natural resources.	BT 2
CO 2	**Apply** the knowledge in protecting and conserving the environment	BT 3

CO 3	**Analyze** the causes, effects and control measures of various types of pollution	BT 4

Paper VIII/Subject Name: Concepts of Behavioural Science		**Subject Code: BHS9825104**
L-T-P-C – 1-0-0-1	**Credit Units: 01**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the various elements of behavioural science.	BT 2
CO 2	**Apply** the concepts learnt in their real life.	BT 3

DETAILED SYLLABUS OF 2ND SEMESTER

Paper II/Subject Name: Physics		**Subject Code: PHY022C201**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of Physics	BT 2
CO 2	**Identify** the applications of Physics in technical field.	BT 3

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Paper II/Subject Name: Mathematics-II		Subject Code: MAT022C202
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** Vector and its applications in applied sciences.	BT 2
CO 2	**Utilize** vector as a tool in the field of applied sciences and related fields.	BT 3
CO 3	**Analyze** and **evaluate** the qualitative behavior of solutions of systems of differential equations and interpret in the context of an underlying	BT 4 & 5

Paper III/Subject Name: Basic Electrical Engineering		Subject Code: ELE022C203
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the concept behind basic electric and magnetic circuits.	BT 2
CO 2	**Apply** the working principles of electrical machines and power converters in real-life.	BT 3

Paper IV/Subject Name: Programming for Problem Solving		Subject Code: CSE022C204
L-T-P-C – 3-0-0-3	Credit Units: 043	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the working of C programming language.	BT 2

CO 2	**Apply** the programming concepts to solve various problems.	BT 3
CO 3	**Analyze** and debug the errors while writing the programs.	BT 4
CO 4	**Assess** and design a new algorithm to solve a new real life problem.	BT 5

Paper V/Subject Name: Physics Lab		**Subject Code: PHY022C211**
L-T-P-C – 0-0-2-1	**Credit Units: 01**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** various experimental principles, instruments/setup, and procedures	BT 2
CO 2	**Organize** experimental data in various appropriate forms like tabulation and plots.	BT 3
CO 3	**Analyze** and **assess** the experimental results	BT 4 & 5

Paper VI/Subject Name: Basic Electrical Engineering Lab		**Subject Code: ELE022C213**
L-T-P-C – 0-0-2-1	**Credit Units: 01**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the concept of circuit laws and network theorems and apply them to laboratory measurements.	BT 2
CO 2	**Apply** the equations that characterize the performance of an electric circuit as well as solving both single phase and DC Machines.	BT 3
CO 3	**Analyze** skills in using electrical measuring devices.	BT 4

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Paper VII/Subject Name: Programming for Problem Solving Lab		Subject Code: CSE022C214
L-T-P-C – 0-0-2-1	Credit Units: 01	Scheme of Evaluation: P

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and trace the execution of programs written in C language.	BT 2
CO 2	**Build** the C code for a given algorithm using various concepts such as pointers and arrays, perform pointer-arithmetic, and use the pre-	BT 3
CO 3	**Analyze,** debug and solve errors and design efficient solutions to various solutions.	BT 4

Paper VIII/Subject Name: Conversation and Public Speaking		Subject Code: CEN982A201
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** various skills of speaking at different levels.	BT 2
CO 2	**Apply** the skills learnt in their day-to-day life.	BT 3

Paper IX/Subject Name: Environmental Sciences-II		Subject Code: EVS982A203
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**

CO 1	**Understand** the importance of environmental studies and methods of conservation of natural resources.	BT 2
CO 2	**Apply** the knowledge in protecting and conserving the environment.	BT 3
CO 3	**Analyse** the causes, effects and control measures of various types of pollution	BT 4

Paper X/Subject Name: Understanding Self and Others		**Subject Code: BHS982A204**
L-T-P-C – 1-0-0-1	**Credit Units: 01**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and visualize one's own self	BT 2
CO 2	**Interpret** one's own behavior	BT 3
CO 3	**Analyse** other's behavior in the light of their present appearance.	BT 4

DETAILED SYLLABUS OF 3RD SEMESTER

Paper I/Subject Name: Mathematics-III		**Subject Code: MAT022C301**
L-T-P-C – 3-1-0-4	**Credit Units: 04**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the importance of random variables and probability distributions and their applications.	BT 2

CO 2	**Solve** a differential, algebraic or transcendental equation using an appropriate numerical method.	BT 3
CO 3	**Analyse** a derivative at a value using an appropriate numerical method	BT 4

Paper II/Subject Name: Discrete Mathematics		Subject Code: MAT022C302
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the concept of logic, sets, relations and functions to solve problems.	BT 2
CO 2	**Apply** the concepts learnt to solve computer science related problems.	BT 3
CO 3	**Analyze** and evaluate the solutions.	BT 4

Paper III/Subject Name: Data Structure & Algorithms		Subject Code: CSE022C303
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Relate** and **understand** the basic constructs of data structure, implementation and application.	BT 1 & 2
CO 2	**Utilize** the appropriate data structure in context of solution of given problem.	BT 3
CO 3	**Analyze** and **evaluate** the pseudocodes for their complexity analysis.	BT 4 & 5

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Paper IV/Subject Name: Computer Organization and Architecture		Subject Code: CSE022C304
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** computer architecture concepts related to design of modern processors, memories and I/O	BT 2
CO 2	**Construct** and **analyse** the performance of commercially available computers.	BT 3 & 4

Paper V/Subject Name: Digital Logic and System Design		Subject Code: ECE022C302
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Define** and **understand** the concepts of combinational and sequential circuit design	BT 1 & 2
CO 2	**Apply** the concepts learnt to design digital circuits.	BT 3
CO 3	**Analyse** the outputs produced and behaviour of the different circuits.	BT 4

Paper VI/Subject Name: Data Structures & Algorithms Lab		Subject Code: CSE022C313
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level

CO 1	**Understand** the application of elementary data structures such as stacks, queues, linked lists, trees and graphs.	BT 1 & 2
CO 2	**Utilize** appropriate data structures to solve various problems.	BT 3
CO 3	**Analyze** and **evaluate** algorithms for its efficiency.	BT 4 & 5

Paper VII/Subject Name: Digital Logic and System Design Lab		**Subject Code: ECE022C312**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the implementation of logic gates on the bread board.	BT 2
CO 2	**Build** combinatorial and sequential circuits based on the concepts gained	BT 3

Paper VIII/Subject Name: Career Oriented Communication		**Subject Code: CEN982A301**
L-T-P-C – 1-0-0-1	**Credit Units: 01**	**Scheme of Evaluation: TP**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the requirement of the job market.	BT 2
CO 2	**Build** oneself for the competitive market of employment with the concepts learnt.	BT 3

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DETAILED SYLLABUS OF 4TH SEMESTER

Paper I/Subject Name: Computer Graphics		Subject Code: CSE022C401
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Illustrate** pictures for presentations	BT 2
CO 2	**Apply** the concepts learnt to implement various shape drawing algorithms, 2D/3D transformations, homogeneous coordinates and viewing.	BT 3

Paper II/Subject Name: OOP using C++		Subject Code: CSE022C402
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basic concepts of OOP.	BT 2
CO 2	**Apply** the concepts learnt to write efficient programs in C++.	BT 3
CO 3	**Analyze** a problem and construct a C++ program that solves it.	BT 4
CO 4	**Assess** a C++ program and describe ways to improve it.	BT 5

Paper III/Subject Name: Database Management Systems		Subject Code: CSE022C403
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basic concepts and applications of database systems	BT 2
CO 2	**Apply** the basic concepts of MySql and write queries using it.	BT 3
CO3	**Analyze** the designed database for normalization.	BT 4
CO 4	**Evaluate** the process of transaction processing and concurrency control	BT 5

Paper IV/Subject Name: Finite Language and Automata		Subject Code: CSE022C404
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the utility and importance of Automata Theory as the basis of all computer science languages design	BT 2
CO 2	**Construct** minimized sample automata and grammars of context free languages	BT 3
CO3	**Analyze** the power and limitation of a computer and solve the problems using formal language	BT 4

Paper V/Subject Name: Principles of Management and Organizational Behavior		Subject Code: BSA022C301
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the managerial functions like planning, and have same basic knowledge on international aspect of management	BT 2

CO 2	**Build** the ability to direct, leadership and communicate effectively	BT 3
CO3	**Analyse** the behaviour of individuals and groups in organisations in terms of the key factors that influence organisational behaviour.	BT 4
CO 4	**Assess** the potential effects of organizational-level factors (such as structure, culture and change) on organizational behaviorr	BT 5

Paper VI/Subject Name: OOP using C++ Lab		**Subject Code: CSE022C412**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Detailed Syllabus:

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the basic concepts of OOP.	BT 2
CO 2	**Solve** problems by writing C++ programs.	BT 3
CO3	**Analyze** and **evaluate** programs for its efficiency.	BT 4 & 5

Paper VII/Subject Name: Database Management Systems Lab		**Subject Code: CSE022C413**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Illustrate** a database schema for a given problem-domain.	BT 2
CO 2	**Build** queries in MySql with the concepts learnt.	BT 3
CO3	**Analyze and evaluate** the queries for its correctness.	BT 4 & 5

Paper VIII/Subject Name: Communication and Presentation Skills		Subject Code: CEN982A401
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the skills required for giving presentations.	BT 2
CO 2	**Build** reports, make presentations and have basic understanding of technology-enabled communication in the 21st century.	BT 3

DETAILLED SYLLABUS OF 5TH SEMESTER

Paper I/Subject Name: Operating Systems		Subject Code: CSE022C501
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of Operating systems.	BT 2
CO 2	**Apply** the principles of scheduling, and concurrency to solve various problems.	BT 3
CO 3	**Analyze** and **evaluate** the execution of simultaneous processes for deadlock	BT 4 & 5

Paper II/Subject Name: Software Engineering		Subject Code: CSE022C502
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:

Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** the various phases of project development.	BT 2
CO 2	**Select** appropriate process model for development depending on the user requirements.	BT 3
CO 3	**Analyze** and **assess** the model developed in terms of risks management and reuse.	BT 4 & 5

Paper III/Subject Name: Principles of Programming Languages		Subject Code: CSE022C503
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** the various syntax and semantics of different programming languages	BT 2
CO 2	**Experiment with** the data, data types, and basic statements of various programming languages	BT 3
CO 3	**Analyze** and **assess** each of the paradigms of programming for their suitable applications	BT 4 & 5

Paper IV/Subject Name: Graph Theory		Subject Code: CSE022C504
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** mathematical definitions of objects in graph theory.	BT 2

CO 2	**Apply** mathematical concepts to solve graph-related problems.	BT 3
CO3	**Utilize** a combination of theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph theory.	BT 3
CO 4	**Analyze** and critically assess a mathematical proof.	BT 4

Paper V/Subject Name: Constitution of India		**Subject Code: POL022S503**
L-T-P-C – 1-0-0-1	**Credit Units: 01**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the nature of the Constitution of India.	BT 2
CO 2	**Identify** the organs of the government, local administration as well as Election Commission of India.	BT 3

Paper VI/Subject Name: Operating Systems Lab		**Subject Code: CSE022C511**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and implement basic services and functionalities of the operating system using system calls.	BT 2
CO 2	**Utilize** modern operating system calls and synchronization libraries in software/ hardware interfaces.	BT 3
CO 3	**Analyze** various Scheduling algorithms to better usage of the CPU.	BT 4

Paper VII/Subject Name: Principles of Programming Languages Lab		Subject Code: CSE022C512
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** the working of various programming paradigms.	BT 2
CO 2	**Apply** the concepts learnt to solve problems with the suitable paradigm and language.	BT 3
CO 3	**Experiment with** different paradigms to solve a particular problem.	BT 3

Paper IX/Subject Name: Ethics and Business Communication		Subject Code: CEN982A501
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** ethical awareness and the ability to do ethical reflection.	BT 2
CO 2	**Apply** ethical principles in decision-making	BT 3

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DETAILED SYLLABUS OF 6th SEMESTER

Paper I/Subject Name: Data Communication and Networks		Subject Code: CSE022C601
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the significance and concepts of computer networks	BT 2
CO 2	**Identify** the layered model for computer networking.	BT 3
CO 3	**Analyze** and **evaluate** basic protocols and design issues for layered model.	BT 4 & 5

Paper II/Subject Name: Design and Analysis of Algorithms		Subject Code: CSE022C602
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the performance of algorithm.	BT 2
CO 2	**Apply** different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc.	BT 3
CO 3	**Analyze** and **evaluate** algorithms to improve their efficiency.	BT 4 & 5

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Paper III/Subject Name: Compiler Design		Subject Code: CSE022C603
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the different phases and passes of the compiler	BT 2
CO 2	**Utilize** the compiler tools like LEX, YACC, etc	BT 3
CO 3	**Analyze** and **assess** the optimized codes to check for satisfiability of each and every grammar.	BT 4 & 5

Paper IV/Subject Name: Microprocessor		Subject Code: ECE022C609
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basic concepts of microprocessor and microcontroller.	BT 2
CO 2	**Apply** the concepts learnt to design and implement programs on 8086 microprocessors, I/O and Memory Interfacing circuits and 8051 microcontroller-based systems.	BT 3

Paper V/ Subject Name: Economics and Accountancy		Subject Code: COM022C601
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the impact of economic variables on the business.	BT 2
CO 2	**Build** financial statements and balance sheets.	BT 3

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CO 3	**Analyze** the financial statements of a company.	BT 4

Paper VI/Subject Name: Data Communication and Networks Lab		**Subject Code: CSE022C611**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** and **compare** the various protocols.	BT 2
CO 2	**Utilize** simulation tools for network programming	BT 3
CO 3	**Analyze** the performance of the routing algorithms and protocols in different layers.	BT 4

Paper VII/Subject Name: Microprocessor Lab		**Subject Code: ECE022C619**
L-T-P-C – 0-0-4-2	**Credit Units: 02**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the concept of 8086 programming using Microprocessor Kit.	BT 2
CO 2	**Construct** small programs on 8086 microprocessor kit.	BT 3

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Paper IX/Subject Name: Effective Workplace Communication		Subject Code: CEN982A601
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** business culture, business etiquettes, decision making, and workplace interpersonal relationships.	BT 2
CO 2	**Apply** the concepts learnt in real life for professional and corporate communication.	BT 3

DETAILED SYLLABUS OF 7TH SEMESTER

Paper I/Subject Name: Web Technology		Subject Code: CSE022C701
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the basic concept of web development	BT 2
CO 2	**Apply** the concepts learnt to develop simple web applications	BT 3
CO 3	**Assess** and **evaluate** two web applications based on various design factors.	BT 4 & 5

Paper II/Subject Name: Artificial Intelligence		Subject Code: CSE022DC702
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level

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CO 1	**Interpret** and manipulate a given problem in the language/framework of different AI methods.	BT 2
CO 2	**Identify** problems that are amenable to solution by AI methods.	BT 3
CO 3	**Analyze** and **assess** basic AI algorithms for their applications.	BT 4 & 5

Paper III/Subject Name: Web Technology Lab		**Subject Code: CSE022C711**
L-T-P-C – 0-0-4-2	**Credit Units: 04**	**Scheme of Evaluation: P**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Interpret** the concepts of front end and backend programming for web development.	BT 2
CO 2	**Apply** the concepts on designing web pages.	BT 3
CO 3	**Analyze** and **test** web applications in different web servers	BT 4 & 5

DETAILED SYLLABUS OF 8TH SEMESTER

Paper I/Subject Name: Cryptography and Network Security		**Subject Code: CSE022C801**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** and **illustrate** basic cryptographic algorithms, message and web authentication and security issues.	BT 2
CO 2	**Demonstrate** the current legal and ethical issues towards information.	BT 2

CO 3	**Identify** the applications of different protocol like SSL, TLS etc.	BT 3
CO 4	**Analyze** and **assess** the security services and mechanisms	BT 4

DETAILED SYLLABUS OF SUBJECTS UNDER ELECTIVE-I

Paper IV/Subject Name: Mobile Computing		**Subject Code: CSE022D701**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** mobile technologies in terms of hardware, software, and communications and describe how mobile technology functions to enable other computing technologies.	BT 2
CO 2	**Utilize** mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures.	BT 3
CO 3	**Analyze** any new technical issues related to new paradigm and come up with a solution(s).	BT 4
CO 4	**Evaluate** the effectiveness of different mobile computing frameworks.	BT 5

Paper IV/Subject Name: Natural Language Processing		**Subject Code: CSE022D702**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the fundamental concepts of Natural Language Processing.	BT 2
CO 2	**Solve** the NLP tasks using various categories of algorithms.	BT 3

CO 3	**Analyze** and **evaluate** the algorithms applied	BT 4 & 5

Paper IV/Subject Name: VLSI Design		**Subject Code: CSE022D703**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fabrication of different MOS devices	BT 2
CO 2	**Apply** a combination of hardware and software to address the given problems.	BT 3
CO 3	**Analyze** and **assess** abstract problems.	BT 4 & 5

DETAILED SYLLABUS OF SUBJECTS UNDER ELECTIVE-II

Paper V/Subject Name: Big Data Analytics		**Subject Code: CSE022D704**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** how to leverage the insights from big data analytics and the various NoSql alternative database models.	BT 2
CO 2	**Apply** different analytic techniques on real-time streaming data	BT 3
CO 3	**Analyze** resultant data using various statistical measures	BT 4 & 5

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Paper V/Subject Name: Introduction to Data Science		Subject Code: CSE022D705
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Illustrate** a flow process for data science problems and **classify** data science problems into standard typology	BT 2
CO 2	**Construct** R or Python codes for data science solutions	BT 3
CO 3	**Examine** results to the solution approach	BT 4
CO 4	**Assess** the solution approach and Construct use cases to validate approach and identify modifications required	BT 5

Paper V/Subject Name: Optical Fiber Communication		Subject Code: CSE022D706
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Illustrate** optical fiber communication link, structure, propagation and transmission properties of an optical fiber	BT 2
CO 2	**Identify** the principles of optical sources and power launching-coupling methods.	BT 3
CO 3	**Analyze** the propagation characteristics of an optical signal in different types of fibers	BT 4

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DETAILED SYLLABUS OF SUBJECTS UNDER ELECTIVE-III

Paper III/Subject Name: Digital Image Processing		Subject Code: CSE022D801
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Illustrate** the importance of image transforms, different types of image transforms and their properties, image compression, etc.	BT 2
CO 2	**Experiment with** the different image enhancement techniques	BT 3
CO 3	**Analyze** the different causes for image degradation.	BT 4

Paper III/Subject Name: Neural Networks and Fuzzy Logic		Subject Code: CSE022D807
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Describe** Fuzzy Logic and Artificial Neural Network techniques in building intelligent machines	BT 2
CO 2	**Apply** Artificial Neural Network & Fuzzy Logic models to handle uncertainty and solve engineering problems.	BT 3
CO 3	**Analyze** the feasibility of applying a Neuro-Fuzzy model for a particular problem	BT 4

Paper III/Subject Name: Embedded Systems		Subject Code: CSE022D803
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level

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CO 1	**Understand** and identify the unique characteristics of real-time systems	BT 2
CO 2	**Apply** real-time systems design techniques to various software programs.	BT 3
CO 3	**Analyze** the unique design problems and challenges of real-time systems	BT 4

Paper III/Subject Name: Bioinformatics		**Subject Code: CSE022D804**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the selected tools at NCBI and EBI to run simple analyses on genomic sequences.	BT 2
CO 2	**Apply** knowledge of bioinformatics in a practical project and develop the ability for critical assessment of scientific research publications in	BT 3
CO 3	**Evaluate** the main databases at the NCBI and EBI resources and compare the databases, tools, repositories and be able to use each one to extract specific information	BT 4

DETAILED SYLLABUS OF SUBJECTS UNDER ELECTIVE-IV

Paper IV/Subject Name: Wireless Computing		**Subject Code: CSE022D805**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the cellular system design and technical challenges	BT 2
CO 2	**Examine** the protocols being used at different layers of cellular network.	BT 3
CO 3	**Analyse** the various design parameters, link design, smart antenna, beam forming and MIMO systems.	BT 4

Paper IV/Subject Name: Computer Vision		Subject Code: CSE022D806
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the different aspects of computing with images.	BT 2
CO 2	**Apply** deep learning techniques to process 2D and 3D images.	BT 3
CO 3	**Analyze** the major technical approaches involved in computer vision.	BT 4

Paper IV/Subject Name: Expert Systems		Subject Code: CSE022D807
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** the role played by expert systems in today's world.	BT 2
CO 2	**Apply**, build and modify decision models to solve real problems.	BT 3

Paper IV/Subject Name: Recent Trends in Computer Science		Subject Code: CSE022D802
L-T-P-C-4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the issues related to IoT, Virtual and Augmented Reality and Soft computing techniques.	BT 2

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CO 2	**Construct,** train and test neural network models and make these models work on practical problems in deep Learning	BT 3

DETAILED SYLLABUS OF OTHER SCHOOL OPEN ELECTIVES TO BE OFFERED BY CSE DEPARTMENT

Paper VIII/Subject Name: Social Media Studies		**Subject Code: CSE022G505**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the idea behind social media, its characteristics, social media growth, content sharing, etc.	BT 2
CO 2	**Identify** how to connect with peoples via social media.	BT 3
CO 3	**Analyse** different types of platforms and its uses, advantage, disadvantage.	BT 4

Paper VIII/Subject Name: Open Source Software		**Subject Code: CSE022G606**
L-T-P-C – 3-0-0-3	**Credit Units: 03**	**Scheme of Evaluation: T**

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Demonstrate** the difference between open-source software and commercial software.	BT 2
CO 2	**Utilize** Linux operating system and manage applications from the said system software	BT 3
CO 3	**Inspect** the applications of web technologies Apache, MySql, PHP.	BT 4

DETAILED SYLLABUS OF RSET OPEN ELECTIVES TO BE OFFERED BY CSE DEPARTMENT

Paper VI/Subject Name: Internet Technology		Subject Code: CSE022G705
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic structure of web designing technology	BT 2
CO 2	**Apply** the concepts of web technology in designing static and dynamic web pages	BT 3
CO 3	**Analyze** and **assess** interactive web pages incorporating validation techniques	BT 4

Paper V/Subject Name: Fundamentals of IOT		Subject Code: CSE022G803
L-T-P-C –4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the concepts of Internet of Things.	BT 2
CO 2	**Utilize** basic IOT applications on embedded platform	BT 3
CO 3	**Analyse** the basic challenges to be tackled in IOT and evaluate the performance of the networks.	BT 4

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(RSET)

SYLLABUS

&

COURSE STRUCTURE

B.TECH.

IN

CIVIL ENGINEERING

2022-23

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Paper III/Subject Name: Developing Oral Communication and Listening Skills		Subject Code: CEN982S101
L-T-P-C - 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• On completion of this course students will be expected to understand the basics of written and oral communication in theory and apply some of the theories in practice.

Paper I/Subject Name: Chemistry		Subject Code: CHY022C101
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• The students will be able to state the first law and to define heat, work, thermal efficiency and the difference between various forms of energy. • Be able to define entropy and free energy and their importance to interpret the spontaneity of chemical reactions. • The Students will be able to understand the principles and applications of electrochemistry and corrosion. • The students will be able to explain the formation of chemical bond. • The students will be able to know the properties and applications of different materials used for engineering.

Paper II/Subject Name: Mathematics-I		Subject Code: MAT022C101
L-T-P-C - 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Apply the single variable differential and integral calculus in Engineering problems. • Apply the multivariable differential and integral calculus in Engineering problems • Develop the concepts of differential and integral calculus to solve real value problems • Learn basic concepts of linear algebra and apply them to solve practical engineering problems.

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Paper V/Subject Name: Concepts of Behavioural Science		Subject Code: BHS98ZS104
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To make the students understand the various elements of behavioral science, the way it is conducted and applied in different researches.
-

Course Outcomes:

On completion of this course the students will be expected to:

- Understand the various elements of behavioral science, the way it is conducted and applied in different research.

Paper VI/Subject Name: Chemistry Lab		Subject Code: CHY022C111
L-T-P-C – 0-0-2-1	Credit Units: 01	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To make the students understand the basics of fundamental phenomenon of Chemistry and application in engineering & technology

Course Outcomes:

On completion of this course the students will be expected to:

- Be able to read drawing which is the most important requirement of all technical people in engineering profession.
- Be to visualize the job in three dimensions.
- Have clear conception and appreciation of the shape, size, proportion and design.
- Be able to clearly express the ideas on the paper by sketches.
- Be able to convert sketches to engineered drawings will increase.

Paper VII/Subject Name: Engineering Graphics & Design		Subject Code: CEE022C117
L-T-P-C – 1-0-4-3	Credit Units: 03	Scheme of Evaluation: TP

Objective:

The objectives of the course are:

- To make students understand about defining and specifying the shape and size of a particular object by means of lines and other information about the object.
- To teach basic engineering drawing formats.
- To make students learn drawing projections and sections.
- To explain how to convert sketches to engineered drawings.

Course Outcomes:

On completion of this course the students will be expected to:

- Be able to read drawing which is the most important requirement of all technical people in engineering profession.
- Be to visualize the job in three dimensions.
- Have clear conception and appreciation of the shape, size, proportion and design.
- Be able to clearly express the ideas on the paper by sketches.
- Be able to convert sketches to engineered drawings will increase.

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Facilitating Learning Outcome based Curriculum Framework (LOCF) Subject: Engineering Graphics & Design Subject Code: CEE022C117 B.Tech 1th Semester
Learning Outcomes
• Will be able to handle drawing instruments with care. • Understand the importance of drawing in engineering. • Will be able to use scales and curves in proper situations. • Students will be able to read and draw objects in different quadrants with elevation and plan. • Students will be able to draw isometric projections from orthographic projections.

Paper VIII/Subject Name: Workshop Practices		Subject Code: MEE022C118
L-T-P-C – 1-0-4-3	Credit Units: 03	Scheme of Evaluation: TP

Objective:

The objectives of the course are:

Course Outcomes

On completion of this course, the students will be expected togain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Paper IV/Subject Name: Programming for Problem Solving		Subject Code: CSE022C204
L-T-P-C – 3-0-0-3	Credit Units: 043	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Learn about the fundamentals of Computers. Have an exposure to the problem solving approach through programming. • Understand about the various constructs of programming. • Have a detailed understanding about writing good programs and algorithms and draw flowcharts

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Paper III/Subject Name: Basic Electrical Engineering		Subject Code: ELE022C203
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understand and analyze basic electric and magnetic circuits. • Study the working principles of electrical machines and power converters. • Introduce the components of low-voltage electrical installations. • Understanding concepts related to various measuring instruments in Electrical Engineering.

Paper V/Subject Name: Conversation and Public Speaking		Subject Code: CEN982A201
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• On completion of this course students will be expected to build an effective Speaking Communication skills

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Paper VII/Subject Name: Understanding Self and Others		Subject Code: BHS982A204
L-T-P-C - 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• On completion of this course the students will be expected to Get an insight into the various aspects of self and how one perceives and comprehends other's behavior in the light of their present appearance.

Paper VI/Subject Name: Environmental Sciences-II		Subject Code: EVS982A203
L-T-P-C - 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understand and analyze basic importance of environmental studies and methods of conservation of natural resources. • Study the Solid/Liquid waste management, disaster management. • Student will learns about the causes, effects and control measures of various types of pollution. • Understanding concepts related to Climate Change – reasons, effects, (global warming, ozone layer depletion, acid rain) with one case study; Legal issues – Environmental legislation (Acts & issues involved), Environmental Ethics

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Paper VIII/Subject Name: Physics Lab		Subject Code: PHY022C211
L-T-P-C – 0-0-2-1	Credit Units: 01	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To make the students understand the basics of fundamental phenomenon of Physics and application in engineering & technology.

Course Outcomes:

On completion of this course the student will be expected to

- Build a strong foundation in basic concepts of Physics that enables them to understand the applications of Physics in technical field.

Paper IX/Subject Name: Basic Electrical Engineering Lab		Subject Code: ELE022C213
L-T-P-C – 0-0-2-1	Credit Units: 01	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To teach the students about basic electrical engineering.

Course outcome:

On completion of this course the students will be expected to:

- Learn about the d.c. networks and theorems
- Learn about the a.c. networks and magnetic circuits
- Learn about the various instruments and their working principle
- Learn about the wiring systems at our homes and the use of other electrical accessories.

Paper X/Subject Name: Programming for Problem Solving Lab		Subject Code: CSE022C214
L-T-P-C – 0-0-2-1	Credit Units: 01	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To make the student learn about problem solving techniques through C programming language.
- To teach the student to write good programs in C.
- To enhance the analyzing and problem solving skills.

Course Outcomes:

On completion of this course the students will be expected to:

- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types.

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Paper IV/Subject Name: Introduction to Fluid Mechanics		Subject Code: CEE022C304
L-T-P-C – 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understanding basic terms, units, fluid classification and fluid properties. • Understanding Pascal's law, its application, Buoyancy and floatation. • Understanding different flow types and the conditions. • Understanding concepts related to fluid dynamics and to do dimensional analysis.

Paper III/Subject Name: Engineering Mechanics		Subject Code: CEE022C303
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Objective: To familiarize students with dimensioning in engineering drawing, equipment and software used for drawing engineering structures. Students are introduced to engineering design and its place in society.

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to solve basic problems related to forces and moments
• Students will be able to find forces in simple beams and also be able to calculate the centroid of any body
• Students will be able to calculate deflections in beams and understand motion of particles
• Students will be able to understand the basic concepts of rotations, degree of freedom, damping and be able to solve simple problems related to it.

Paper II/Subject Name: Computer Aided Civil Engineering Drawing		Subject Code: CEE022C301
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to exposure to the visual aspects of engineering design & engineering communication. • Students will be able to find Exposure to engineering graphics standards. • Students will be able to Exposure to computer-aided geometric design and solid modelling. • Students will be able to understand the Exposure to creating working drawings.

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Paper VI/Subject Name: Introduction to Civil Engineering		Subject Code: CEE022C306
L-T-P-C – 3-0-0-3	Credit Units: 02	Scheme of Evaluation: T

Subject: Introduction to Civil Engineering Subject Code: CEE022C306 B.Tech 3rd Semester
Learning Outcomes
• Basic understanding of Civil Engineering.
• Get a brief idea of vast interfaces that this field has with the society at large. It gives an Inspiration and proficiency for doing creative and innovative work.
• It gives an encouragement to take up entreprenеurial activities in this field. Get a foundation to pursue an inspired academic pursuit in this branch of engineering
• It provides a brief idea of Vast interfaces/tools which can be used for various technical analysis or experimental methodologies. It also invites research mentality amongst the students.

Subject Name: Mathematics-III		Subject Code: MAT022C301
L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objectives of **Mathematics-III(MAT022C301)** are

- To provide the fundamentalconcepts of probability theory.
- To introduce the basic concepts of one-dimensional and two-dimensional Random Variables.
- To provide information about Estimation theory, Correlation, Regression and Testing of hypothesis.
- To explain numerical methods to solve algebraic and transcendental equations.
- To enable develop appropriate numerical methods to solve a differential equation.

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understand the probability theory to solve problems of engineering field. • Learn different statistical techniques to solve problems of engineering field. • Develop idea to apply interpolation formula and use numerical differentiation and integration to solve practical problems. • Apply numerical methods to solve algebraic, transcendental and differential equations.

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Paper VII/Subject Name: Career Oriented Communication		Subject Code: CEN982A301
L-T-P-C - 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• On completion of this course students will be expected to build an effective understanding of the job market and prepare for it.

Paper VIII/Subject Name: Biology for Engineers		Subject Code: BIO022G301
L-T-P-C - 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To impart necessary background of biological science for facilitating the understanding emulation of biological processes in various applications in the field of engineering such as neural networks, biomedical engineering, biosensors, micro-scale engineering etc.
- To impart basic understanding of cell structure, cell functioning and processes
- To create the awareness of genetic process of evolution and its relevance to engineering applications.
- To provide knowledge about biological problem that requires engineering expertise to solve them and application of emulation of biological processes to solve engineering problems.

Course Outcomes:

On completion of this course the students will be expected to:

- Learn the necessary background of engineering biology for those who want to pursue their career in the areas of MEMS, biomedical engineering, research in genetic and evolutionary algorithms and their applications to optimisations, neuro-fuzzy systems and related heuristic algorithm.

Paper IX/Subject Name: Introduction to Solid Mechanics		Subject Code: CEE022C309
L-T-P-C - 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF) Subject: Introduction to Solid Mechanics Subject code: CEE022C309 Semester: 3rd
Learning Outcomes
• Students will be able to calculate amount of deformations in elastic bodies. • Students will be able to identify the failure criteria
• Students will be able to determine the amount of bending moment and shear force. • Students will be able to determine the moment resisting capacity of a beam.
• Students will be able to determine shear strength of a section this will help the students to estimate the serviceability of a structural member.
• The students will understand the torque carrying capacity of a shaft. • This will help the students to design fluid storage tanks.

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Paper II/Subject Name: Energy Science & Engineering		Subject Code: CEE022C402
L-T-P-C – 1-1-0-2	Credit Units: 02	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of energy sources, energy generation, transformation of energy and energy storage mechanisms & principles.
• Students will be able to learn the significance of energy conservation & clean technology in context to environmental issues and accordingly plan future • energy use with the aid of trade and research policies.
• Students will be able to gather knowledge on the uses, applications and constraints of different energy sources related to various practical projects likewise coal mining, underground pipe installation, • offshore technology, hydroelectric power etc.
• Students will have a broad and descriptive knowledge on Green building & architecture, the green components for systematic & practical design of a green building.

SYLLABUS (4TH SEMESTER)

Paper I/Subject Name: Engineering Geology		Subject Code: CEE022C401
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Site characterization and how to collect, analyze& report geologic data using standards in engg. Practice. The fundamentals of the engineering properties of Earth materials and fluids.
• Rock mass characterization and the mechanics of planar rock slides and topples.
• Soil characterization and the Unified Soil Classification System
• Understanding concepts on rock masses, features affecting the quality of rocks, rock quality and designation, selection of rocks for dam and reservoir, The mechanics of soils and fluids and their influence on settlement, liquefaction, and soil slope stability.

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Paper IV/Subject Name: Surveying & Geomatics		Subject Code: CEE022C404
L-T-P-C – 2-1-0-3	Credit Units: 03	Scheme of Evaluation: T

Objectives: The objective of this Course is to introduce students to the field of surveying as applied in civil engineering field. The course is also aimed at familiarizing students with various methods and instruments used for surveying.

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understanding basic terms, units of surveying and surveying methods.
• Understanding and applying methods to calculate area, volume in field and error determination.
• Understanding and using modern survey instruments.
• Understanding concepts related to EMS and applications of RS.

Paper V/Subject Name: Construction Engineering & Management		Subject Code: CEE022C405
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Learning Outcomes
• Will have an idea of how structures are built, and projects are developed on the field.
• Will understand modern construction practices.
• Will have an idea of basic construction dynamics- various stakeholders, project objectives, • processes, resources required and project economics.
• Acquire basic ability to plan, control and monitor construction projects with respect to time and cost.

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Paper VI/Subject Name: Structural Analysis I		Subject Code: CEE022C406
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to differentiate between various structures and calculate deflections in simple beams.
• At the end of this module students will be able to calculate forces due to loads in arches, stiffening girders and cables used in simple bridges
• At the end of this module students will be able to calculate forces, stresses, deflections in fixed beam structures, arches, continuous beams and simple frames
• Students will be able to deal with design of curved beams

Paper VII/Subject Name: Hydraulic		Subject Code: CEE022C407
L-T-P-C – 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Objectives: To introduce the students to various hydraulic engineering problems viz. open channel flows, hydraulic machines and help students relate the theory and practice of problems in hydraulic engineering

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understanding the laminar flow, turbulent flow and boundary layer, its effect on circular pipe, Rough boundaries, also learning about friction developed in varies pipes and flow through plate.
• The students will be able to apply their knowledge of fluid mechanics in addressing problems in open channels.
• They will possess the skills to solve problems in uniform, gradually and rapidly varied flows in steady state conditions. They will have knowledge in hydraulic machineries (pumps and turbines).
• Understanding the losses of head through pipe, flow parameters for parallel and series pipe. The basic equation of fluid dynamics, grid generation, Also learning about viscid incompressible flow

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Paper VIII/Subject Name: Communication and Presentation Skills		Subject Code: CEN982A401
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Objective:

The objectives of the course are:

- To prepare students to develop report writing skills, deliver effective presentation and be informed about technology-enabled communication in the 21st century.

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• The objectives of the course is to prepare students to develop report writing skills, deliver effective presentation and be informed about technology-enabled communication in the 21 st century.

SYLLABUS (5TH SEMESTER)

Paper I/Subject Name: Structural Analysis II		Subject Code: CEE022C501
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to calculate forces in statically determinate and indeterminate structures
• Students will be able to calculate forces in statically determinate and indeterminate structures
• Students will be able to calculate stresses in unsymmetrical beams and find out location of neutral axis
• Students will be able to calculates forces in structures due to moving loads

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Paper II/Subject Name: Concrete Technology		Subject Code: CEE022C502
L-T-P-C – 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF) Subject: Concrete Technology Subject Code: CEE022C502 B.Tech 5th Semester
Learning Outcomes
• Basic understanding of Concrete Technology
• Students will be able to ascertain the quality of concrete & have clear understanding of the internal framework of concrete as a whole.
• Students will be able to determine the safety and serviceability of the concrete to be used in any structure. The mix design concept will be helpful in field of Construction and any research work on the material Concrete.
• Students will be able to decide which type of concrete to be used, considering its properties and application.

Paper III/Subject Name: Transportation		Subject Code: CEE022C503
L-T-P-C – 3-0-0-	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understanding about the history and classification of road, different highway alignment and its design
• Understanding the traffic characteristics and different traffic regulation and design of various elements related to design of traffic regulation
• Understanding the different Materials used in Highway Construction and its problem
• Understanding concepts of flexible and rigid pavement and its design and various problem related to flexible and rigid pavement

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Paper IV/Subject Name: Geotechnical Engineering		Subject Code: CEE022C504
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Subject: Geotechnical Engineering Subject Code: CEE022C504 B.Tech. 5th semester
Learning Outcomes
• Students shall be able to grasp the basic concepts of soil engineering, learn to solve problems based on three phase system and determine the soil parameters with the aid of different testing methods.
• Students shall be able to classify soil based on plasticity characteristics and learn to solve practical problems on permeability and seepage.
• Students shall be able to estimate the stresses under any system of foundation loads and solve practical problems related to consolidation settlement and time rate of settlement.
• Students shall be able to estimate shear strength parameters, analyze the stability of any hill slope and also suggest remedial measures considering the site exploration techniques and data.

Paper V/Subject Name: Environmental		Subject Code: CEE022C505
L-T-P-C - 2-0-0-	Credit Units: 02	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Will be able to understand the treatment processes for purifying water. • Understand water supply schemes. • Will be able to Design sewerage systems. • Will be able to understand National River cleaning plans. • Students will be able to understand Collection, transport, treatment and disposal methods of MSW. • Students will be able to properly use the plumbing systems for water supply and waste water disposal

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Paper VI/Subject Name: Ethics and Business Communication		Subject Code: CEN982A501
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: TP

Objective:

The objectives of the course are:

- To introduce students to truthfulness, accuracy, honesty, and reason as essential to the integrity of communication.
- Ethicswill enable a student to use specific capacities and skills to make moral decisions.
- Students should develop, demonstrate and act out their ethical abilities.

Course Outcome:

On completion of this course the students will be expected to:

- Demonstrate ethical awareness, the ability to do ethical reflection, and the ability to apply ethical principles in decision-making

Paper VII/Subject Name: (Open Elective I)	Subject Code: CEE022G501	
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Objective: The main objective is to see natural resource management in developing countries from a sustainable perspective. The main focus is on land and water resources in the light of climate change.

Outcomes: At the end of the course the students will be able to

- Identify, analyse, and reflect upon basic natural resource problems that affect the development process
- Identify and understand general and specific uses of natural resources, at present and in the long term, in the light of sustainability theory
- Analyse development phenomena in connection to resource use employing key concepts/theories learnt and formulate research questions about the effects of natural resource utilisation on development.

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SYLLABUS (6TH SEMESTER)

Paper I/Subject Name: Hydrology & Water Resources Engineering		Subject Code: CEE022C601
L-T-P-C - 2-1-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Understanding Hydrologic cycle, its effect on precipitation and abstractions. • Understanding and applying concepts to analyse hydrographs, mass curves, etc. • Understanding ground water flow and concepts of well hydraulics. • Understanding forces acting on dams, stress analysis and sedimentation control

Paper II/Subject Name: Design of Concrete Structures		Subject Code: CEE022C602
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF) Subject: Design of Concrete Structures Subject Code: CEE022C602 B.Tech 6th Semester
Learning Outcomes
• Students will learn to apply the fundamental concepts of limit state method and use IS code of practice for the design of concrete elements. • Students will learn to design safe and serviceable structures ensuring shear and bond checks. • Students will be able to understand, design and analyse the structural Reinforced Concrete beams and slabs in bending, shear, compression and torsion keeping the reinforcement detailing, Deflection and crack control of reinforced concrete members as per IS specifications. • Students will be able to understand, design and analyse the structural Reinforced Concrete stairs and columns in bending, shear, compression and torsion keeping the reinforcement detailing, Deflection and crack control of reinforced concrete members as per IS specifications.

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Paper III/Subject Name: Railway Engineering and Airport Planning & Design (Elective I)		Subject Code: CEE022D601
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Application of basics ofRailwayEngineering to solve practical problems. • Students will be able to handle the design, construction, and operation of railroads and mass transit systems • Students will be able to perform engineering design of airport. • Design and construct airports and can account for the impacts and demands of aircraft in their design of airport facilities.

Paper III/Subject Name: Traffic Engineering & Management (Elective I)		Subject Code: CEE022D602
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of travel forecasting principles, different methods of traffic forecast and estimate PCU under mixed traffic conditions.
• Students will be able to learn the capacity study of different highway facilities including unsignalized and signalised intersections.
• Students will be able to gather knowledge about the significance of statistical data in step by step procedure of accident analysis. • Students will be able to practically visualise the influence of roadway characteristics , traffic conditions and driver,s strain on traffic safety.
• Students will be able to gather knowledge on the applications of Traffic flow theory, the probabilistic approach and formulation of simulation techniques to analyse traffic problems and plan for traffic systems for various uses.

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Paper IV/Subject Name: Construction Project Planning & Systems (Elective II) Subject Code: CEE022D603		
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of travel forecasting principles, different methods of traffic forecast and estimate PCU under mixed traffic conditions.
• Students will be able to learn the capacity study of different highway facilities including unsignalized and signalised intersections.
• Students will be able to gather knowledge about the significance of statistical data in step by step procedure of accident analysis. • Students will be able to practically visualise the influence of roadway characteristics , traffic conditions and driver,s strain on traffic safety.
• Students will be able to gather knowledge on the applications of Traffic flow theory, the probabilistic approach and formulation of simulation techniques to analyse traffic problems and plan for traffic systems for various uses.

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Paper IV/Subject Name: Building Construction Practice (Elective II)		Subject Code: CEE022D604
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• To learn the Constructions type and various types of shallow foundation and to Execute various types of masonry work
• To Construct various structural and non-structural building components
• Understanding the Erect various temporary works for new and existing buildings.
• Understanding concepts related for Selecting appropriate method of construction.

Paper V/Subject Name: (Open Elective II)	Subject Code: CEE022G601	
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Objective:

To prepare competent rural development professionals who will be well-equipped with the concepts, approaches and opportunities of rural energy sources and community development.

Course Outcomes:

At the end of the course, the students will-

- Have knowledge about the human and natural / non-natural resources and their sustainable use.
- Have skills to develop and implement rural energy projects for application.
- Know the best practices in institutional arrangements for rural development.

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Paper VI/Subject Name: Physico-chemical Processes for Water & Wastewater Treatment (Elective III)		Subject Code: CEE022D605
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Objective:

To provide in depth understanding of physical and physio-chemical processes used for water and wastewater treatment systems and to provide capability to design such systems.

Outcomes:

At the end of the course the students will:

- Have in depth knowledge of the common physicochemical processes occurring in water/wastewater
- Demonstrate how the same processes are utilized in engineered systems (e.g., water treatment plants)

Paper VI/Subject Name: Biological Processes for Contaminant Removal (Elective III)		Subject Code: CEE022D606
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Have a sound knowledge of microbiology fundamentals applied to biological treatments Correctly implement the procedures for determining kinetic and stochiometric parameters
• Apply knowledge of enzyme reaction kinetics to reactor design
• Analyse the different options applicable to different substrates.
• Examine the different equipment options required for each treatment

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Paper VII/Subject Name: Irrigation Engineering (Elective IV)		Subject Code: CEE022D607
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of supplying water by artificial means for cultivation
• Students will be able to know the water requirement of crops & efficiencies of irrigation
• Students will be able to gather knowledge about the different methods of irrigation. Students will be able to design canals, diversion headworks, canal regulation works.
• Have proper idea about the types of drainage system and their installation

Subject: Design of Steel Structures

Subject Code: CEE022C701

B.Tech. 7th Semester

Learning Outcomes

- Students shall be able to grasp the basic concepts of steel structures, design the semi-rigid, rigid and moment resistant connections.
- Students shall be able to differentiate between tension and compression members and design of tension and compression members, splicing, beam- column connections.
- Students shall be able to apply the principles, procedures and current Indian Codal provisions to the analysis and design of industrial structures, plate girder & foot-over bridges.
- Students shall be able to apply the principles of plastic design in steel beams & portal frames.

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Paper I/Subject Name: Elective-V (a) Water Resources Field Methods		Subject Code: CEE022D702.1
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Measure stream velocity, discharge, travel time, bank-full stage, hydrologic return intervals
• Measure stream and land slopes, areas; determine land cover
• Work safely in various field environments.
• Conduct basic laboratory analytical analyses

Paper I/Subject Name: Elective-V (b) Water Quality		Subject Code: CEE022D702.2
L-T-P-C – 3-0-0-3	Credit Units:	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Student will able to Describe the water quality standards. And Design and analyze water treatment reactors. • Understanding to Apply physical processes to improve water quality. • Understanding and Applying chemical processes to improve water quality. • Understanding and Analyzing the energy demand of treatment systems and understand the latest technologies.

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Paper I/Subject Name: Elective-VI (a)Bridge Engineeri		Subject Code: CEE022D703.1
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Subject: Elective -VI (Bridge Engineering)

Subject Code: CEE022D703

B.Tech. 7th semester

Learning Outcomes

- Students shall be able to grasp the preliminary and requisite conditions for bridge design both in rural and urban areas.
- Students shall be in a position to analyze and design the superstructure part of different bridge types following the IRC loading standards.
- Students shall be in a position to analyze and design the sub-structure part of bridges with thorough knowledge of the different sub-structure components
- Students shall be in a position to apply prestressing technique to design different bridge structures based on functionality.

Paper I/Subject Name: Open-Elective-III		Subject Code: CEE022G704
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Subject: Elective -III (Plumbing & Water Supply)

Subject Code: CEE022G704

B.Tech. 7th semester

Learning Outcomes

- Students shall be able to grasp the preliminary and requisite conditions for Plumbing Engineering and its History in development in plumbing engineering.
- Students shall be in a position to analyze the operations and tools used in plumbing system.
- Students shall be in a position to understand the different materials used in plumbing system and also the alignment, Working tools and also concepts on building materials used in construction.
- Students shall be in a position to to learn different pipe joints, different types of pipes used in plumbing. And types of valve used in plumbing system

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Paper I/Subject Name: Disaster Preparedness & Planning		Subject Code: CEE022C705
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Learning Outcomes

- Application of Disaster Concepts to Management
- Ability to understand Categories of Disasters.
- Analysing Relationship between Development and Disasters.
- Realization of the responsibilities to society.
- Understanding of Government policies of Disaster Management

Paper I/Subject Name: Engineering Economics, Estimation & Costing		Subject Code:
L-T-P-C - 2-1-0-	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)

Learning Outcomes

- Have an idea of Economics in general, Economics of India particularly for public sector agencies and private sector businesses.
- Be able to perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
- Be able to quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure.
- Be able to understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure.

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Paper I/Subject Name: Project-1		Subject Code: CEE022C726
L-T-P-C – 0-0-8-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

- To provide motivation for the students to solve real world problems using mathematics and engineering principles.
- To motivate students to participate in group discussions and thereby exchange ideas.
- To serve as platform to identify research issues in existing systems.
- To impart the ability for project planning and also to develop the skill of implementing the ideas generated from the curricular components.

Course Outcome: After successful completion of this course, the students will be able to:

- Apply knowledge of mathematics, science and engineering principles to solve complex real world problems bringing out economically and socially feasible solutions upholding ethical values.
- Participate in peer group discussions and integrate ideas.
- Apply the knowledge base about advanced topics pertaining to area of study to design and implement solutions to challenging problems.
- Identify new research problems from issues raised during implementation.
- Communicate problems and solutions to society through reports.
- Manage time and resources effectively.

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Paper I/Subject Name: Earthquake Engineering		Subject Code:CEE022CB01
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students shall be able to grasp the basic concepts of earthquake engineering, its applications, causes and to learn the seismic zoning of India as per Indian Codal provision. • Students shall be able to response of SDOF & MDOF structural system subjected to vibration including earthquake. • Students shall be able to understand the concept of Earthquake Resistant Design & the concept of lateral load distribution on buildings. • Students shall be able to apply the concept of geotechnical aspects in earthquake engineering.

Paper I/Subject Name: Foundation Engineering		Subject Code:CEE022D803.1
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of selection of foundation based on soil conditions from different sub soil investigation methods. • Students will be able to assess the various shear and settlement criteria, estimate the bearing capacity of soil, proportionate the footing and accordingly design shallow foundations as per codal provisions. • Students will be able to learn pile installation methods and the load transfer mechanism in pile. • Students shall be able estimate the load carrying capacity of pile foundations in different soil conditions which shall help in solving complex real site problems. • Students will have a preliminary idea on designing foundations on expansive soils with the aid of preventive & remedial measures.

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Paper I/Subject Name:Elective-VII (b) Rock Mechanics		Subject Code:CEE022D803.2
L-T-P-C – 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of Classification of Intact rock Field shear test, Deformability tests in rock mass, State of stress in the ground Various methods of stress measurement. • Students will be able to assess the various Elastic and elasto-plastic approach Mohr Coulomb Yield Criterion Tensile Yield Criterion. • Students will be able to learn Fracture strength of jointed rock mass Modes of failure, Plane failure, Wedge failure • Students will have a preliminary idea on Estimation of bearing capacity, Stress distribution in rocks. Grouting in Rocks Numerical modeling of rocks and rock masses, Application to tunnels, slopes.

Paper I/Subject Name:Elective-VIII (b) System		Subject Code:CEE022D804.2
L-T-P-C – 3-0-0-3	Credit Units: 03 S	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of Types of systems, Subsystems, Super systems, Need for system analysis and design, CASE tools for analysis and its limitations. • Students will be able to assess the various methods of system analysis, system development life cycle, structured approach, development tools, data base and networking techniques. • Students will be able to learn Design technologies, design principles, design tools and methodologies, feasibility survey. • Students will have a preliminary idea on Introduction, Object modeling, Dynamic modeling, functional modelling, UML diagrams .

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Paper I/Subject Name:Elective-IV (Building Materials)		Subject Code:CEE022G805
L-T-P-C - 3-0-0-3	Credit Units: 03	Scheme of Evaluation: T

Facilitating Learning Outcome based Curriculum Framework (LOCF)
Learning Outcomes
• Students will be able to perceive the basic concept of selection of Stones, Bricks, Concrete Blocks as building material. • Students will be able to assess about Lime,Cement, Aggregates,Mortar and its manufacturing process and it properties • Students will be able to learn real site problems regarding concreate and its mix specification. • Students will have a preliminary idea on Timber and other material i.e .Steel, Aluminum, Bitumens, Glass etc.

Anuradha Dey

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ROYAL GLOBAL UNIVERSITY

GUWAHATI

ROYAL SCHOOL OF BIO - SCIENCES

(RSBSC)

Department of Biochemistry

Biochemistry Postgraduate Programme

For

M.Sc. Biochemistry

The Assam Royal Global University IQAC Estd : 2016

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PAPER I: CHEMISTRY OF BIOMOLECULES
SUBJECT CODE: BCH154C101
CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The course is designed to introduce the analytical aspect of biochemistry and educate students about the various bioorganic and biochemical reactions and formulations.	1. Students will recall the core knowledge base in the theory and practice of modern Biochemistry and Biophysics. 2. Students will understand the mechanism of different Biochemical and Biophysical reactions 3. Students will be able to analyze the coordination necessary in biochemical functioning, like in the case of hemoglobin 4. Students will be able to analyze the biochemistry of micro nutrients	Powerpoint presentations; Teaching using chalk and board; Oral discussion sessions in the Class	Oral questions will be asked in the class. Problems will be assigned to test student's Analytical ability. Class tests will be conducted for internal Assessment.

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PAPER II: CELL BIOLOGY
SUBJECT CODE: BCH154C102
CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The course entails to educate the student about the basic biology and physiology of a cell, and important structural and functional properties	1. Students will recall the core knowledge of different structural and functional properties of a cell 2. Students will understand the role of compartmentalization and the importance of cell biology in biochemistry. 3. Students will apply these principals to current biological questions of today. 4. Students will analyze how cells grow, divide, and die and the importance of these processes. 5. Students will determine how its dysregulation leads to cancer and other diseases.	Chalk and board teachings, power point presentations, and video presentations on the step by step process of mitosis and meiosis will be shown, chronology of molecular events in various processes will be shown as flowchart.	Discussions, oral Questioning and analytical questions will be given to students. Internal exams and seminars will be conducted

Adm

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PAPER III: BIOENERGETICS AND METABOLISM
SUBJECT CODE: BCH154C103
CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The objective of the course is to introduce the students with fundamental concepts	1. Students will remember the thermodynamic parameters associated with the metabolism of biological macromolecules. 2. Students will understand the role of different metabolic enzymes in biological catalysis 3. Student will define biochemical functions and integrated metabolism in different tissues 4. Students will analyze the key regulatory points in metabolic pathways 5. Students will explain molecular mechanisms underlying major inherited diseases of metabolism	Chalk and board teachings, power point presentations	Discussions, oral Questioning and analytical questions involving calculations of bioenergetics will be given to students. Internal exams and seminars will be conducted.

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PAPER IV: PRACTICAL I

SUBJECT CODE: BCH154C114
CREDIT UNITS: L-T-P-C = 0-0-3-3
STUDENT'S SCHEME OF EVALUATION: PRACTICAL (P)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The objective of the course is to introduce the students with fundamental concepts of energy production and metabolism of the biological macromolecules	1. Students will remember the thermodynamic parameters associated with the metabolism of biological macromolecules. 2. Students will understand the role of different metabolic enzymes in biological catalysis 3. Student will define biochemical functions and integrated metabolism in different tissues 4. Students will analyze the key regulatory points in metabolic pathways 5. Students will explain molecular mechanisms underlying major inherited diseases of metabolism	Chalk and board teachings, video presentations of the methology, calculations guidance, conversion of moles, molar, mg, g, L etc, weighing, handling equipments and hands on practicals	Discussions, oral Questioning and analytical questions will be given to students. Students' hands on' learning will be regularly monitored

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PAPER I: ENZYMOLOGY
SUBJECT CODE: BCH154C201
CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To introduce the students to enzyme types, mechanisms and regulation.	Students will learn about 1. Students will learn about Different enzyme classifications, various aspects of action mechanism of enzyme, role of metals in enzyme action, organization of enzymes in cells and enzyme mechanisms and regulation. 2. Students will understand the basis of enzyme classification, role of various	Chalk and board teachings, powerpoint presentations	Discussions, oral Questioning and analytical questions will be given to students. Internal exams and seminars will be conducted
	factors in enzyme activity, role of amino acids in enzyme actions and the role of cellular conditions in enzyme regulation. 3. Students will be able to analyse the role of different amino acids and cofactors in enzyme reactions. 4. Student will be able to evaluate the important amino acids in enzyme reactions		

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PAPER II: MOLECULAR BIOLOGY
SUBJECT CODE: BCH154C203
CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course	Course Learning Outcomes	Teaching and Learning	Assessment Tasks
Objective		**Activity**	
To educate students as well as to demonstrate knowledge and understanding of the molecular machinery of living cells.	Students will learn about – 1. Students will learn about the central dogma of life, post transcriptional and post translational events, gene cloning and recombinant D.N.A. based technologies. 2. Students will understand the processes of central dogma, proteins involved in post transcriptional and post translational events and principles guiding gene cloning and recombinant D.N.A. based technologies. 3. Students will be able to analyse the interrelation of central dogma with the metabolic state of a cell, the implications of various processing events, and the nuances of gene cloning and recombinant D.N.A. based technologies. 4. Students will be able to evaluate the role of these events in maintaining a healthy cell.	Chalk and board teachings, power point presentations	Discussions, oral Questioning and analytical questions will be given to students. Internal exams and seminars will be conducted.

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PAPER III:IMMUNOLOGY
SUBJECT CODE: BCH154C214

CREDIT UNITS: L-T-P-C = 3-1-0-4
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To introduce the students to the concept of Immunology and the functioning of the different components of the immune system.	Students will learn about 1. Students will learn about organization of the immune system, antibodies and their diversity, immune reaction systems, immune disease, immuno-based assays and diseases associated with the immmune system. 2. Students will understand the basis of immune system organization, working mechanism of the immune reaction systems, working principles of the immune-based assays and the molecular basis of immune system based diseases. 3. Students will be able to analyse the inter-relations between the functioning of the different immune reaction systems. 4. Students will be able to evaluate the role of different immune systems in the development of immune related diseases.	Chalk and board teachings, powerpoint presentations	Discussions,oral Questioning and analytical questions will be given to students. Internal exams and seminars will be conducted

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PAPER IV: PRACTICAL II
SUBJECT CODE: BCH154C214
CREDIT UNITS: L-T-P-C = 0-0-3-3
STUDENT'S SCHEME OF EVALUATION: PRACTICAL (P)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To introduce the basic techniques in molecular biology and spectrophotometric detection of biomolecules and their separation.	Students will learn about- 1. Students will learn about the principles of enzyme based assays, estimation of haemoglobin and measurement of blood cells like WBC, R.B.C., separation of biomolecules using different techniques, designing primers, running PCR and immune assays. 2. Students understand the basis of adding different chemicals and working steps for carrying out the experiments. 3. Students will be able to analyse their	Chalk and board teachings, calculations guidance, video presentation of the methodology, conversion of moles, molar, mg, g, L etc, weighing, handling equipments and	Discussions, oral Questioning and analytical questions will be given to students. Students' hands on' learning will be regularly monitored
	results and make adjustments to their protocols when required. 4. Students will be able to evaluate the results and discuss the reasons behind the results.	hands on practicals	

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PAPER I: ADVANCED ENZYMOLOGY
SUBJECT CODE: BCH154C301
CREDIT UNITS: L-T-P-C = 2-1-0-3
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To provide a deeper insight into the fundamentals of enzyme structure, multi-unit enzyme interactions and regulation.	1. Various aspects of enzymes like multisubstrate reactions, turnover of enzymes, cooperation between enzyme subunits, multienzyme systems, vitamins in enzyme reactions and reaction mechanisms of enzymes. 2. Students will understand the biochemistry of multisubstrate reactions, cellular requirements for turnover of enzymes, conformational changes in protein cooperation, and advantages of multienzyme systems and role of vitaminsin enzyme reactions. 3. Students will be able to apply the gained knowledge in carrying out enzyme related studies. 4. Students will be able to analyse the interdependence of the various aspects discussed in the functioning of the enzymes.	Powerpoint presentations, teaching using chalk and board, regular oral discussion sessions in the class on topics taught previously	Students will be asked questions; Quiz, internal assessment Tests will be conducted.

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PAPER II:CLINICAL BIOCHEMISTRY
SUBJECT CODE: BCH154C302
CREDIT UNITS: L-T-P-C = 2-1-0-3
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course	Course Learning Outcomes	Teaching and Learning	Assessment Tasks
Objective		**Activity**	
To introduce the various parameters that determine a healthy and diseased state and to understand the workings of disease progression and development.	Students will learn about- 1. The method of specimen collection and analysis; metabolic disorders, syndromes arising out metabolic disorders and the biochemistry of cancer. 2. Students will understand the various aspects clinical biochemistry, their implications in health, causes and implications of metabolic disorders and the biochemical basis of cancer. 3. Students can apply the knowledge gained to deliberate on clinical findings, check the relation of metabolites and syndromes associated with build-up of metabolites and the biochemical reasons leading to cancer progression. 4. Students will be to analyse the relation of body metabolites and their deregulation with appearance of metabolic syndromes and relate the buildup of cancer specific conditions in the progression of cancer.	Teaching will be conducted both through white board mode and power point presentation Mode. Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any.	Oral questions will be asked; students will be asked to discuss the topic. Quiz, internal assessment Tests will be conducted.

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PAPER III: Practical III
SUBJECT CODE: BCH154C314
CREDIT UNITS: L-T-P-C = 3-0-0-3
STUDENT'S SCHEME OF EVALUATION: Practical Papers (P)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To develop skills of performing basic biochemical tests important in clinical investigations.	Students will learn- 1. Students will learn the principles of determination of activation energy, estimation of serum metabolites like cholesterol, urea etc, activity determination of SGOT and SGPT. 2. Students will understand the principles and the various reasons behind the protocols being followed. 3. Students will be able to analyse the results and make changes in the protocols as required. 4. Students will be able to evaluate the health status based on the results of the serum metabolites and enzymes.	Chalk and board teachings, calculations guidance, video presentation of the methology, conversion of moles, molar, mg, g, L etc, weighing, handling equipments and hands on practicals	Discussions, oral Questioning and analytical questions will be given to students. Students' hands on'learning will be regularly monitored

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PAPER III: Practical III
SUBJECT CODE: BCH154C314
CREDIT UNITS: L-T-P-C = 3-0-0-3
STUDENT'S SCHEME OF EVALUATION: Practical Papers (P)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To develop skills of performing basic biochemical tests important in clinical investigations.	Students will learn- 1. Students will learn the principles of determination of activation energy, estimation of serum metabolites like cholesterol, urea etc, activity determination of SGOT and SGPT. 2. Students will understand the principles and the various reasons behind the protocols being followed. 3. Students will be able to analyse the results and make changes in the protocols as required. 4. Students will be able to evaluate the health status based on the results of the serum metabolites and enzymes.	Chalk and board teachings, calculations guidance, video presentation of the methology, conversion of moles, molar, mg, g, L etc, weighing, handling equipments and hands on practicals	Discussions, oral Questioning and analytical questions will be given to students. Students' hands on'learning will be regularly monitored

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PAPER I: MICROBIOLOGY
SUBJECT CODE: BCH154C402
CREDIT UNITS: L-T-P-C = 2-1-0-3
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The course aims To give students a conceptual foundation for understanding pathogenic microorganisms, with a focus on the underlying processes of their pathogenicity.	1. Study the distinction between prokaryotes and eukaryotes 2. Gain an understanding of microbial diversity, bacterial morphology and its growth patterns. 3. Study about microbe pathogenicity and analyze the mechanism of action and epidemiology of pathogens, 4. As well as evaluate the industrial applications of microorganisms. 5. Analyze several microscopy techniques, their operating principles, applications, and distinctions.	Students will be asked to orally revise the previousclass before every new class helping them in better understanding andtheir doubtsCleared, if any.Videos will beshown in the classfor a betterunderstanding ofThe concepts.Teaching will beconducted boththrough white board mode and power point presentationsmode	Oral questions will be asked inthe class. Problems will be assigned to test student'sanalytical ability. Class tests willbe conducted for internalAssessment.

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PAPER II: MEMBRANE BIOLOGY
SUBJECT CODE: BCH154C402
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The course aims To educate students about the structures and functions of basic components of prokaryotic and cukaryotic	Students will 1. Study about the structure of bio-membranes, the fluid mosaic model, and the liposome. 2. Micelles, membrane asymmetry, macro and micro domains in membranes, lipid rafts, caveolae, tight junctions, and R.B.C. membrane architecture will be discussed. 3.Explore membrane dynamics and the	Students will be asked to orally revise the previous class before every new class. Teaching will be conducted both	Oral questions will be asked inthe class. Problems will be assigned to test student's Analytical ability. Class tests willbe conducted for internalassessment.

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PAPER III: PRACTICAL IV
SUBJECT CODE: BCH154C413
CREDIT UNITS: L-T-P-C = 0-0-3-3
STUDENT'S SCHEME OF EVALUATION: Theory Papers (T)

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To teach students how to execute fundamental microbiological and membrane based practical.	Students will 1. learn the principles behind stain-reagent- and culture medium- preparation 2. Evaluate the critical role of sterilization in microbiology experiments. 3. Learn about bacterial isolation, staining, identify bacteria using biochemical tests and motility and comprehend the bacterial growth patterns and as well as conduct SDS-PAGE. 4.understand and assess the effect of detergents on erythrocytes, the effect of ethanol on beetroot membranes, and the influence of lipid composition on lipid monolayer permeability	Chalk and board teachings, video presentations of the methodology, calculations guidance, conversion of moles, molar, mg, g, L etc., weighing, and handling equipment	Discussions, oral Questioning and analytical questions will be given to students. Students' hands on' learning will be regularly monitored

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M.SC. BIOCHEMISTRY (CBCS STRUCTURE)
DISCIPLINE SPECIFIC ELECTIVE (D.S.E.) COURSES

Discipline Specific Elective Course – I (DSE - I): BIOANALYTICAL TECHNIQUES
Subject Code:BCH154D101
Credits: 3-1-0-4; Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The objective of the course is to provide students with a broad understanding of the principles of bioanalytical instrumentation and to provide an appreciation of their uses.	1. Students willgain familiarity with working principle, tools and methodology of analytical techniques 2. Students will understand the strengths, limitations and creative use of techniques in biological science 3. Students will execute the techniques for biological experiments 4. Students will be able to make a strategy on molecular techniques for the improvement of the results Students will assess the industrial application of the laboratory techniques	Markerand board, Powerpoint presentations, student interaction	Students will be given assignment for example; oral questions will be asked

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Discipline Specific Elective Course – I: PLANT BIOCHEMISTRY
Code: BCH154D101
Credits: 4; Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The course aims at providing deep understanding of metabolic processes in plants	1. Students will be introduced to basic plant cell structure, photosynthesis, carbon cycle, stress responses, and plant defences. 2. Students will be able to understand the basic make up of cell structure, scheme of photosynthesis, the reactions of carbon cycles, the hormones and metabolites in stress and pathogen response. 3. Students will be able to analyse the functioning of the plant cell metabolism under various conditions. 4. Students will be able to evaluate the metabolites and biochemical pathways that are critical for plant survival.	Teaching will be conducted through both black board mode and power point presentation mode. Special lecture will be organized on current aspects of photosynthesis and carbon fixation.	Preparation of summary of differences of plant cells from cells of various other organisms; Retrieval of original research papers on photosynthesis, accessory pigments, water splitting complex, light reactions and associated topics. They will separate photosyntheticpigmentsby T.L.C.

Adm
Director, NAHS
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Discipline Specific Elective Course–II (DSE-II): NUTRITIONAL BIOCHEMISTRY
Subject Code: BCH154D201
Credits: 3; Total Hours: 48

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To understand the basic nutrients and their functioning in the tissues	1. Students will be able to learn the basics of nutritional biochemistry, vitamins, minerals, and diseases associated with excessive sugar intake and malnutrition. 2. Students will understand the role of different nutrients in maintaining the healthy state, and the working mechanisms of various nutrition associated diseases. 3. Students will be able to analyse the biochemical functioning of different nutrients. 4. Students will be able to evaluate the importance of nutrients in health	Students will be asked to revise the previous class before every new Class orally. Teaching will be conducted boththrough whiteboard mode andpower pointpresentationMode.	Students will be asked questions, Quiz, internal assessment. Tests will be conducted.
	and the issues arising out of malnutrition, fasting and obesity.		

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Discipline Specific Elective Course –II (DSE-II): NEUROBIOCHEMISTRY
Subject Code: BCH154D201
Credits: 3, Total Hours: 48

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
This paper provides a basic understanding of the nervous system and nerve cell functioning	1. Students will learn about the nervous system, transmissions, transmitters and neuro-degradative diseases. 2. Students will understand the biochemistry of nerve signaling, transmitters and neuro-degradative diseases. Students will be able to analysethe functioning of the nervous systems and the significance the various transmitters in the nerve functioning.	Students will be asked to orally revise the previous class before everynew class helpingthem in betterunderstanding andtheirdoubtscleared, if any. Videos will beshown in the classfor a better Understanding ofthe concepts. Teaching will beconducted	Oral questions will be asked in the class. Problems will be assigned to test student's analytical ability.Class tests will be conducted for internal assessment.
	3. Students will be able to evaluate the biochemical events leading to the development of neuro-degradative diseases.	boththrough white boardmode and powerpoint presentations mode	

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Discipline Specific Elective Course – III /IV/V: Environmental Science
Subject Code: BCH154D304
Credits: 4, Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
This course introduces students to environment concerns factors affecting it, environmental ethics and its protection	1. Students will learn the basics of environmental science, types of resources, pollution, and biodiversity. 2. Students will understand the basics of environmental sciences, the functioning of various resources, sources and causes of pollution, and the importance of biodiversity. 3. Students will be able to analyse the importance of renewable resources, ways to curb pollution, and importance of biodiversity. 4. Students will be able to evaluate the losses arising out of	Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any. Teaching will be conducted both through white board mode and power point presentations mode	Oral questions will be asked; students will be asked to discuss the topic. Quiz, internal assessment tests will be conducted.
	environmental degradation and help in conservation.		

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Discipline Specific Elective Course – III/IV/V: Research Methodology
Subject Code: BCH154D301/302/303
Credits: 4; Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Students will be introduced to the basics of research process, design, report writing and statistical analysis	1. Students will learn about research methodology, defining research problems, experimental designs and result analysis. 2. Students will understand the processes involved in research methodology, identifying research problems, experimental designs and result analysis 3. Students will be able to analyse the research problems and research results. 4. Students will be able to evaluate the research issues, results and how to move ahead with the statistical analysis.	Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any. Teaching will be conducted both through black board mode and power point presentation mode.	Oral questions willbe asked; students will be asked to discuss the topic.

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Discipline Specific Elective Course – III/IV/V: Genetics for Biologist
Subject Code: BCH154D301/302/303
Credits: 4, Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To introduce students to mendelian, human and microbial genetics	1. Students will learn about mendelian, human and microbial genetics 2. Students will understand the differences in the mendelian and non-mendelian genetics, 3. Students will be able to analyse the pedigrees. 4. Students will be able to evaluate the gene maps	Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any. Videos will be shown in the class for a better understanding of the concepts. Teaching will be conducted both through white board mode and power point presentations mode	Oral questions will be asked in the class. Problems will be assigned to test student's analytical ability. Class tests willBe conducted for internal assessment.
genetics and DNA mutat ion, repair			

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Discipline Specific Elective Course – VI/VII/VIII: Biochemistry of Common Disorders
Subject Code:BCH152D401/402/403
Credits: 4, Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To provide knowledge about common life style disorders and the molecular details of their development.	Students will 1. study about the diverse components of human physiology, 2. acquire knowledge about numerous illnesses and disorders that typically occur in humans and analyze various biochemical indicators that occur during these diseases and disorders. **3.** gain understanding about the biochemical phenomena in cardiovascular disorders, renal diseases, and cancer and AIDS. 4. evaluate and learn applications of numerous diagnostic tools for detecting biochemical parameters and markers in blood under pathophysiological settings.	Teaching will be conducted both through white board mode and power point presentation mode. Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any.	Oral questions will be asked; students will be asked to discuss the topic. Quiz, internal assessment tests will be conducted.

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Discipline Specific Elective Course – VI/VII/VIII: General Pharmacology
Subject Code: BCH154D401/402/403
Credits: 4, Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
To introduce the mode of action, transport and effects of drugs.	Students will 1. study the pharmacological actions of several drug classes 2. describe drug action mechanisms at the organ system, subcellular, and macromolecular levels. 3. able to investigate the effect of medications on animals through simulated studies; 4. apply their fundamental pharmacological knowledge in the prevention and treatment of various illnesses 5. evaluate the correlation between	Regular chalk and board teaching along with PPT presentations. Class discussions on syllabus topics will be performed. Software's/ Videos will be issued to demonstrate animal experiment. Practical demonstration will	MCQ based assignments will be given to students to check their understanding of the subject. Oral questions will be asked in the class. Students will be given to prepare power
	pharmacology and other biomedical disciplines.	be given.	point presentation on the assigned topics related to the class teachings. Problem solving assignments, regular question answer sessions, and unit-test for internal assessment

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Discipline Specific Elective Course – VI/VII/VIII: Molecular Endocrinology
Subject Code: BCH154D401/402/403
Credits: 4, Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The objectives of this course are to introduce the basic principles, organs and systems in mammalian (human) endocrinology	1. Students will learn about the endocrine glands and their diseases, details about thyroid hormones, adrenal gland hormones and pancreatic hormones. 2. Students will understand about the workings of the different hormones and the resultant diseases. 3. Students will be able to analyse the biochemistry of hormone actions and the responsible proteins involved in regulating hormone action. 4. Students will be able to evaluate the reasons and mode of action of various drugs aimed at countering hormonal diseases.	Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared,if any. Teaching will be conducted both through white board mode and power point presentations mode	Students will be evaluated Through class discussion, Assignments, presentations and tests.

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Discipline Specific Elective Course –VI/VII/VIII: Genetic Engineering
Subject Code: BCH1545D401/402/403
Credits: 4; Total Hours: 64

Facilitating the achievement of Course Learning Outcomes

Course Objective	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
This course aims to give an insight into the direct manipulation of DNA to alter the characteristics of an organism in a particular way.	1. Students will learn about thescope of genetic engineering , enzymes involved, cDNA library construction, tools of genetic engineering, applications of genetic engineering. 2. Students will be able to understand the principles of genetic engineering, working mechanisms of enzymes involved in genetic engineering, making of libraries, and the use of genetic engineering. 3. Students will be able to analyse the role of enzymes in genetic engineering, and its potential applications in curing diseases. 4. Students will be able to evaluate the ethical issues concerning genetic engineering.	Students will be asked to orally revise the previous class before every new class helping them in better understanding and their doubts cleared, if any. Videos will be shown in the class for a better understanding of the concepts. Teaching will be conducted both through white board mode and power point presentations mode	Oral questions will be asked in the class. Problems will be assigned to test student's analytical ability. Class tests will be conducted for internal assessment.

Anuradha Devi

Director, IQAC
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ROYAL GLOBAL UNIVERSITY
GUWAHATI

(Royal School of Languages)

(RSL)

(Department of English)

SYLLABUS

&

COURSE STRUCTURE

M.A English

The Assam Royal Global University IQAC Estd : 2018

Director, IQAC
The Assam Royal Global University

SYLLABUS (1ST SEMESTER)		
Paper 1/Subject Name: English Literary and Cultural History		**Subject Code: ENG104C101**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:

The objective of the course is to introduce the students to the literary and cultural history of England and enable them to develop critical insights into the history of English literature in its social, cultural, intellectual and political contexts with references from the representative key writers of the age.

Course Outcomes: On completion of this course the students are expected to be able to relate literary creations of various ages to their social, cultural, intellectual and historical contexts and various conflicts and movements of thought.

SYLLABUS (1ST SEMESTER)		
Paper 2/Subject Name: English Poetry -1 (Chaucer to Pope)		**Subject Code: ENG104C102**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:

The objective of the course is to help students to develop insights into the nature, form and concerns of poetry produced during the period stretching from Chaucer to Pope by engaging with certain key texts. Prerequisites: Students should have knowledge of English poets and some of their works.

Course Outcomes:

On completion of this course students are expected to develop a deeper understanding of the varied types of poetry produced during the period.

SYLLABUS (1ST SEMESTER)		
Paper 3/Subject Name: English Drama (Marlowe to Webster)		**Subject Code: ENG104C103**
L-T-P-C – 3-1-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to help the students to chart the development of British Drama during the Elizabethan and Jacobean periods by reading and interpreting representative texts.

Course Outcomes: On completion of this course students will be expected to demonstrate understanding of the social and artistic movements that have shaped the theatre of the period, and display their ability to analyze and interpret texts critically both in writing and performance.

SYLLABUS (1ST SEMESTER)		
Paper 4/Subject Name: Non-Fictional Prose		**Subject Code: ENG104C104**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:

The objective of the course is to develop in students an appreciation of the genre of non-fictional prose and essay by introducing some essays written between sixteenth and twentieth century.

Course Outcomes:

On completion of this course students will develop an understanding of the growth of non-fictional prose in English in different cultural and political contexts over the ages and acquire the skill of reading, interpreting and analyzing prose writings.

SYLLABUS (1ST SEMESTER)		
Paper DSE 1-1/Subject Name: Indian Writing in English		**Subject Code: ENG104D101**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce the students to the select writings in English by Indian authors, encouraging them to read the texts in their social, cultural and historical contexts.

Course Outcomes: On completion of this course students will be expected to be able to critically read and analyze the texts, displaying an awareness of the broad social and historical context.

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SYLLABUS (1ST SEMESTER)

Paper: DSE1-2/Subject Name: Cultural Studies		Subject Code: ENG104D102
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to introduce the students to the interdisciplinary field of Cultural Studies and familiarize them with key concepts of Cultural theory and enable them to look at the contemporary and historical cultural phenomena of India with particular focus on North East India.

Course Outcomes: On completion of this course students will be able to display an understanding of the key concepts and make an effort to use them in writing about socio-cultural phenomena in the context of India and its North East Region.

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Shakespeare		Subject Code: ENG104C201
L-T-P-C – 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to introduce the students to some of the significant dramatic works of William Shakespeare and guide them to explore the richness of Shakespearean texts and relate them to the present context.

Course Outcomes: On completion of this course students will be able to display their critical understanding of the variety of Shakespearean plays while discussing and writing about them.

SYLLABUS (2nd SEMESTER)

Paper 2/Subject Name: English Poetry II		Subject Code: ENG104C202
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to help the students to develop critical insight into the diversity of English poetry from the Romantic period to the Modern Period with an awareness of the social, political and intellectual developments in England.

Course Outcomes: On completion of this course students will be able to identify and critically analyze important features of Romantic, Victorian and Modern English poetry in the texts read with an understanding of the literary movements and sensibilities.

SYLLABUS (2nd SEMESTER)		
Paper 3/Subject Name: English Fiction (Defoe to Mary Shelley)		**Subject Code: ENG104C203**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce the students to the English novel from the Seventeenth to the early Nineteenth century, developing in them an understanding of the social and literary context in which the novel emerged and developed.

Course Outcomes:

On completion of this course students will be able to write critically on various aspects of the texts read, displaying an understanding of their social and literary context.

SYLLABUS (2nd SEMESTER)		
Paper 4/Subject Name: English Drama (Congreve to Pinter)		**Subject Code: ENG104C204**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to the development of British Drama from the Restoration to the Modern period. Students are also expected to read about and relate the circumstances that influenced, shaped and contributed to the process of literary production during this period.

Course Outcomes: On completion of this course students are expected to be able to trace the development of British Drama from the Restoration to the Modern period and make critical assessment of various aspects of the texts read.

SYLLABUS (2nd SEMESTER)		
Paper DSE 2-1/Subject Name: Literature and Film Adaptation		**Subject Code: ENG104D201**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to literature and film as two related art forms that are in constant dialogue overlapping varying divergences. Moving beyond a study of direct adaptation, this class will consider broader issues of influence, expansion, and extrapolation in the exchange of material and modalities between these sometimes competing, sometimes collaborative narrative forms.

Course Outcomes: On completion of this course students will be expected to correlate and appreciate the inter-textual connections between the visual and the textual medium. They will be familiar with prevailing theories on film and literature to appreciate a text.

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SYLLABUS (2nd SEMESTER)

Paper DSE 2-2/Subject Name: Life Narratives **Subject Code: ENG104D202**

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to the concept of autobiography and biography, and to make them read autobiographies and biographies closely and explicate texts written in a wide variety of forms, styles, structures, and modes.

• **Course Outcomes:** On completion of this course students will be expected to be familiar with a wide range of literary terms and categories relating to life narratives and biographies. Students will demonstrate an ability to grasp and synthesize ideas in literary form and use literary terms in historical contexts.

SYLLABUS (3rdSEMESTER)

Paper 1/Subject Name: English Fiction (James Joyce to Kazuo Ishiguro)
Subject Code: ENG104C301
L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce the students to some of the significant works of modernist and postmodernist fiction in English, developing in them an awareness of innovations in thematic treatment and techniques noticed in these works.

Course Outcomes:

On completion of this course students will be able to critically respond to the key texts of modernism and postmodernism.

SYLLABUS (3rd SEMESTER)

Paper 2/Subject Name: Literary Criticism (Classical to Eco-Criticism)
Subject Code: ENG104C302
L-T-P-C – 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to the major trends in the history of literary criticismand theory and also acquaint them with the key texts of leadings critics/thinkers.

Course Outcomes: On completion of this course students will be expected to use some of the concepts and techniques in reading and interpreting literary texts.

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SYLLABUS (3rd SEMESTER)		
Paper DSE 3-1/Subject Name: Modern American Literature		**Subject Code: ENG104D301**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to understand and appreciate important works of American literature as the outcome of its tradition, culture and politics, especially concentrating on the Lost Generation, the Great Depression, the American Dream, Harlem Renaissance and related issues. Prerequisites: Students should have knowledge about American Literature.

Course Outcomes: On completion of this course students will be expected to be familiar with the history of *American* poetry, drama, fiction, and social and literary criticism from the early 17th century through the turn of the 21st century.

SYLLABUS (3rd SEMESTER)		
Paper DSE 3-2/Subject Name: Crossing Cultures		**Subject Code: ENG104D302**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to world literature and its cultural and historical contexts.

Course Outcomes: On completion of this course students will be expected to articulate and defend their grounding ideas, to turn research and critical thinking into cogent arguments, and to express themselves clearly and with style taking into account the wide cultural variants of world literature.

SYLLABUS (3rd SEMESTER)		
Paper DSE 3-3 /Subject Name: African Literature I		**Subject Code: ENG104D303**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to some of the representative texts of the African sub-continent and thereafter acquire a critical insight and understanding of African Literature as an outcome of African culture, politics and thought. The students will learn about the archetypal Modern African Novel, Post-colonial critique of African societies, British Colonialism, Capitalism, African communities, Individual vs Culture, Religion, Tradition, Myth etc.

Course Outcomes: On completion of this course students will be expected to know what makes African literature unique and also comprehend factors that help in setting African Literature apart from other literature.

Adv

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SYLLABUS (3rd SEMESTER)		
Paper DSE 3-4 /Subject Name: Language and Linguistics I		**Subject Code: ENG104D304**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T/P/TP)**

Course Objective:
The objective of the course is to enable students to get an insight into the field of English Linguistics and its types and to grasp the complexity of language as a communication system shaped by cognitive, biological, cultural, and social factors. They will also demonstrate an understanding of the concepts, theories, and methodologies used by linguists in qualitative and quantitative analyses of linguistic structure, and patterns of language use.

Course Outcome: On completion of this course students will be expected to demonstrate understanding of variations in language and analyze language from varied perspectives like phonetics, phonological, and morphological and semantics.

SYLLABUS (3rd SEMESTER)		
Paper DSE 3-5/Subject Name: Literature and Gender		**Subject Code: ENG104D305**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to Gender Studies as an interdisciplinary study devoted to gender identity and gendered representation as central categories of analysis. This includes women's studies, feminism, gender, politics, men' s studies and queer studies.

Course Outcome: On completion of this course students will be expected to understand difference as an essential concept in gender studies. By engaging with some of the works of the representative writers, students will develop their ability to read and interpret literary texts dealing with gender issues.

SYLLABUS (3rd SEMESTER)		
Paper DSE 3-6/Subject Name: Literature of the North East: Oral and Written		**Subject Code: ENG104D306**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to the vast treasure of oral and written literary traditions of North East India with its variety of forms born of its nature, environment and culture in a multiplicity of languages.

Course Outcomes: On completion of this course students will be expected to know the veritable treasures of oral and written literary traditions of North East India. They will also develop an understanding of some of the major literary expressions from the region.

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SYLLABUS (4TH SEMESTER)

Paper 1/Subject Name: Post-Colonial Literature **Subject Code: ENG104C401**

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to postcolonial theory and literary texts produced in postcolonial contexts enabling them to handle literary texts from a postcolonial perspective.

Course Outcomes: On completion of this course students will be able to apply the insights gained from their study in reading and interpreting texts produced in postcolonial contexts.

SYLLABUS (4TH SEMESTER)

Paper 2/Subject Name: The Classic and the Contemporary: A Compendium
Subject Code: ENG104C402
L-T-P-C – 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to some of the most recent of the literary works and thereby encourage them to assess the relationship between contemporary literature and the literature after the 1950s. This module will explore the concepts of modernism and postmodernism, and the relationship between the two, by reading a range of novels and plays which engage with issues of form, subjectivity, and aesthetics.
Prerequisites: Students are expected to have basic idea about contemporary literature.

- **Course Outcomes:** On completion of this course students will be expected to have an understanding ofthe self-conscious break with the traditional ways of writing in both drama and fiction. They will identify issues dealing with different ideas of temporality and semiotics in modernist and postmodernistwriting, comprehend different versions of borrowing from the past that one finds in modernism andpostmodernism, and also understand what purposes these borrowings serve.

SYLLABUS (4TH SEMESTER)

Paper DSE 4-1/Subject Name: Approaches to Comparative Literature
Subject Code: ENG104D401
L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to the discipline of Comparative Literature, its broad outline and history, key issues relating to its theory and cross cultural transactions involved.

Course Outcomes: On completion of this course students will be expected to go beyond the traditional concept of single-language literary study towards a comparative understanding of other literary traditions and in so doing can compare and contrast distinctive features of existing schools of Comparative Literature

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SYLLABUS (4TH SEMESTER)		
Paper DSE 4-2/Subject Name: African Literature II		**Subject Code: ENG104D402**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to some more representative texts of the African sub-continent and thereafter acquire a critical insight and understanding of what constitutes African literature, the differences between national and ethnic literature, the use of English as a national language, Coloured Identity, Cultural Transformation, and Apartheid.

Course Outcomes: On completion of this course students will be expected to know what makes African literature unique and also comprehend factors that help in setting African Literature apart from other literature.

SYLLABUS (4TH SEMESTER)		
Paper DSE 4-3/Subject Name: Language and Linguistics – II		**Subject Code: ENG104D403**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objectives of the course is to introduce students to a comprehensive study of literary stylistics, language acquisition, syntax and language and culture.
Prerequisites: The students should be familiar with the basics of linguistics.

Course Outcome: On completion of this course students will be expected to understand some majorconcepts of linguistics, and to identify the relation of language with its applied fields of study like stylistics, neurolinguistics, syntax and sociolinguistics

SYLLABUS (4TH SEMESTER)		
Paper DSE 4-4/Subject Name: Diaspora Studies		**Subject Code: ENG104D404**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:
The objective of the course is to introduce students to Diaspora Studies which is a new interdisciplinary area that has emerged in Humanities and Social Sciences dealing with the study of migration and its cultural, literary, social, demographic, anthropology, political, economic impact and international relations.

Course Outcomes: On completion of this course students will be expected to critically engage with issues of global migration and Diaspora from multi-disciplinary perspectives and produce quality research and knowledge for academia, government and society.

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SYLLABUS (4TH SEMESTER)		
Paper DSE 4-5/Subject Name: Cultural Studies II		**Subject Code: ENG104D405**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T)**

Course Objective:

The objective of the course is to introduce students to advanced theoretical and critical perspectives of Cultural Studies such as Ethnicity, Gender, Heritage and Folklore with reference to their Indian reality.

Course Outcomes: On completion of this course students will be expected to master the political dynamics of contemporary culture, its historical foundations and its defining traits and power, since cultural studies is a field of theoretically, politically, and empirically engaged cultural analysis.

SYLLABUS (4TH SEMESTER)		
Paper DSE 4-6/Subject Name: Invisible Exchanges: Aesthetics		**Subject Code: ENG104D406**
L-T-P-C – 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: (T/P/TP)**

Course Objective:
The objective of the course is to introduce students to compare between literature and other mediums such as Film, Music or Visual Arts, and enable them to trace the broad movements of systems and aesthetics within Western and Indian literatures, studied with respect to texts.

Course Outcomes:

On completion of this course students will be expected to compare and contrast between history of aesthetics, of the dramatic mode of visual arts and literature, the interrelationship between discourse, literature and music in Western and Eastern theories and practice.

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ROYAL GLOBAL UNIVERSITY

GUWAHATI

ROYAL SCHOOL OF LIFE SCIENCES

DEPARTMENT OF BOTANY

PROPOSED SYLLABUS & COURSE STRUCTURE

MASTER OF SCIENCE IN BOTANY

W.E.F. SEPTEMBER 2022

2022-2023

The Assam Royal Global University IQAC Estd : 2016

Anuradha Dev.

Director, IQAC
The Assam Royal Global University

1ST SEMESTER SYLLABUS

CORE PAPERS (ALL COMPULSORY)

PAPER I: MYCOLOGY & PLANT PATHOLOGY
SUBJECT CODE: BOT144C101,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T);
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:

The course is designed with the objectives to introduce pathological significance of various plant pathogens and to build up the knowledge among the students about host parasite interaction and the methods to develop disease free plants.

Course Outcomes:

By the end of the course the students will be able to:

CO1: **Outline** and **Classify** the Kingdoms of fungal diversity.**[BT1 &BT2]**
CO2: Review and **relate** to different types of fungal association and the recent trends in its application.**[BT2 &BT3]**
CO3:Categorizethe different types of plant pathogens and the host parasite mechanism of action. **[BT4]**.
CO4:Explain the different biotechnological techniques that can be used for disease and pest management. **[BT4]**

PAPER II: MICROBIOLOGY
SUBJECT CODE: BOT144C102,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The course is designed to introduce the students on the structural and functional property of microbial diversity and to enlighten them about the ecological and economic importance of different microbes.

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Course Outcomes:

By the end of the course the students shall be able to:

CO1: **Classify**the physical dimensions, forms, function and habitats of bacteria. **[BT2].**
CO2:Generalise the structure of typical viruses, their mode of replication, host ranges of typical plant and animal viruses and pathogenesis of viral diseases.**[BT2].**
CO3: Interpret the different ecological group of microoragism and select the different modes of nutrition techniques required for its growth.**[BT3 &BT4].**
CO4: Outline the various modes of industrial application for production of value-aided products. **[BT4].**

PAPER III: CRYPTOGAMS
SUBJECT CODE: BOT144C103,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:

To teach the students about the Origin, classification, diversity, economic and ecological importance of algae, bryophytes and pteridophytes.

Course Outcomes:

By the end of the course the students shall be able to:

CO1:**Classify** algae based on habitat, structure, mode of division and reproduction. **[BT2].**
CO2: **Generalize** the different classes of byrophytes based on its habitat, mode of reproductionand its association with other microorganisms.**[BT2].**
CO3: **Discuss** the origin and classes of pteridophytes and **illustrate** the culture of fern gametophyte for experimental investigation. **[BT2].**
CO4: **Illustrate and outline** the application of phycology, bryology and pteridophytes in environment monitoring. **[BT3 &BT4].**

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PAPER IV: GYMNOSPERMS & ADVANCED MORPHOLOGY
SUBJECT CODE: BOT144C104.
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three): Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:

The course has been devised to impart information on various types of seed plants present, their significance and to highlight on both gymnosperms and advanced morphological structures in plant kingdom.

Course Outcomes:

By the end of the course the students shall be able to:

CO1:**Outline** the origin, evolution and salient structural features of gymnosperms.**[BT1]**
CO2:**Describe** the characteristic of living gymnosperms along with its application to overcome environmental stresses **[BT2 &BT3]**
CO3:**Sketch and examine** the differentiation phenomenon that lead to the development of advanced morphology in plants: **[BT3 &BT4]**

PAPER V: MYCOLOGY, PLANT PATHOLOGY & MICROBIOLOGY (PRACTICAL)
SUBJECT CODE: BOT144C116
CREDIT UNITS: 0-0-6-3
SCHEME OF EVALUATION: Practical (P)
[Continuous Evaluation: 25%: Skill Test, lab copy, viva, lab involvement (Any Three) Attendance: 5%, Semester End Examination: 70%]

Course Objective:

To introduce the students to the world of microbes by showing live cultures and photographs of bacteria and viruses and to enable the students to have a hands-on experience on observing algae and fungi under microscope.

Course Outcomes:

By the end of the course the students shall be able to:

CO1: Use the different laboratory equipment used in microbiology.**[BT3]**
CO2: Prepare culture media for different microoragnisms. **[BT3]**
CO2: **Perform** experiments used in identification, isolation and characterisation of bacteria, fungi and mycorhizza.**[BT4]**
CO4: **Select and outline** plant diseases bases on symptoms.**[BT4]**

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PAPER VI: CRYPTOGAMS, GYMNOSPERMS & ADVANCED MORPHOLOGY (PRACTICAL)

SUBJECT CODE: BOT144C116

CREDIT UNITS: 0-0-6-3

SCHEME OF EVALUATION: Practical (P)

[Continuous Evaluation: 25%: Skill Test, lab copy, viva, lab involvement (Any Three) Attendance: 5%, Semester End Examination: 70%]

Course Objectives:

Study of diversity of algae, bryophytes and Pteridophytes w.r.t systematic position and morphology. The course also entails morphological, anatomical and reproductive features of angiosperms and the study on structure of some selected species

Course Outcomes:

By the end of the course the students shall be able to:

CO1: Use the different laboratory equipment used in microbiology: **[BT3]**

CO2: Prepare culture media for different microoragnisms.: **[BT3]**

CO2: Perform experiments used in identification, isolation and characterisation of bacteria, fungi and mycorhizza: **[BT4]**

CO4: Select and outline plant diseases bases on symptoms. **[BT4]**

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DISCIPLINE SPECIFIC PAPERS (only one to be selected)

PAPER I: BIOPROCESS DEVELOPMENT
SUBJECT CODE: BOT144D101,
CREDIT UNITS: L-T-P-C = 3-0-0-3
SCHEME OF EVALUATION: Theory (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:

The course is developed with an aim to identify and apply biological agents for the production of a specific bioproduct with the desired yield and purity.

Course Outcomes:

On completion of the course the student shall be able to:

CO1:Classify PGPM and **predict** the use of specific PGPM in different areas of agriculture. **[BT2 & BT3]**
CO2:Categorize the different microbes and the raw materials that can be used for the production of different types biofuels. **[BT 4]**
CO3: Outline a model that can be used be tried and applied for future perspective. **[BT4]**

PAPER II: ETHNOBOTANY AND PHYTOGEOGRAPHY
SUBJECT CODE: BOT144D102,
CREDIT UNITS: L-T-P-C = 3-0-0-3
SCHEME OF EVALUATION: Theory only (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:
Introducing the students to traditional knowledge of plants and to give idea about the various vegetations present across India. The course will also give them an idea about the various ethnic groups present in NE states.

Course outcomes:

On completion of the course the student shall be able to:

CO1: Identify the endemic and rare species that needs conservation.**[BT2]**
CO2: Locate the distribution profile of plants throughout the globe. **[BT2]**
CO3: Prepare world maps based on phytogeography. **[BT3]**

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2ND SEMESTER SYLLABUS

CORE PAPERS (ALL COMPULSORY)

PAPER I: ANGIOSPERM TAXONOMY
SUBJECT CODE: BOT144C201
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: THEORY (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The course is designed to give perspective on the historical development of plant taxonomy, its classification and the knowledge about the systematic tools used in the classification of plants at cellular and molecular level.

Course Outcomes:

CO1: **Describe** the history, origin, and diversity of plant classification and distribution.**[BT2]**
CO2: **Predict** the family of flower based on its floral structure. **[BT2]**
CO3:**Analyze** evolutionary processes of a plant based on well-founded hypotheses of evolutionary relationships.**[BT4]**
CO4: **Identify** the variation between species using different molecular techniques. **[BT4]**

PAPER II: CYTOLOGY, GENETICS & PLANT BREEDING
SUBJECT CODE: BOT144C202,
CREDIT UNITS (L-T-P-C) : 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:
The course aims to enable the students understand the structures of plant at the cellular, sub-cellular and molecular levels

Course outcomes:

CO1: **Describe** different subcellular organelles and **elucidate** structure, growth, division, signalling, differentiation and death of plant cells. **[BT2]**
CO2: **Distinguish** the basis of prokaryotic, eukaryotic and cytoplasmic genome organisation. **[BT2]**
CO2: **Predict**the basis of inheritance and variation caused due to mutation and abberations. **[BT3]**
CO4: **Evaluate** the techniques to create new varieties with a set of desired characteristics. **[BT4]**

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PAPER III: PLANT PHYSIOLOGY
SUBJECT CODE: BOT144C203,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course objectives:

The course is designed to acquaint the students with the various physiological processes inside the plant body, the crosstalk between different pathways/processes and the factors that affect its biosynthesis and regulation.

Course outcomes:

CO1: **Describe** the different processes – photosynthesis, mineral nutrition, respiration, transportation, and ultimately plant development and growth**[BT2]**
CO2:**List** the different plant hormones and **interpret** its application for crop improvement programs. **[BT2 and BT4]**
CO3: **Identify** the key regulating points of different processes that can be targeted for enhancing the plant trait and yield. **[BT4]**

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DISCIPLINE SPECIFIC PAPERS (only one to be selected)

PAPER I: GENOMICS AND PROTEOMICS
SUBJECT CODE: BOT144D201,
CREDIT UNITS: L-T-P-C = 3-0-0-3
SCHEME OF EVALUATION: Theory (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The course is designed to give the students an idea about the structure and function of various genes in an organism, basic concept of functional proteins and to give the students a basic idea on latest techniques related to genomic studies.

Course Outcomes:

By the end of the couse the student will know to

CO1: Describe the genome organisation and the advances in the field of genomics and proteomics.**[BT1 & BT2].**

CO2: Interpret and Analyse differential gene expression using different techniques such as - ESTs, SAGE, microarrays. **[BT3 &BT4]**

CO3:Compute and examinethe structure and function of protein, the complexities of protein–protein interactions through advanced technologies. **[BT3 & BT4].**

PAPER II: BIODIVERSITY AND CONSERVATION BIOLOGY
SUBJECT CODE: BOT144D202,
CREDIT UNITS: L-T-P-C = 3-0-0-3
SCHEME OF EVALUATION: Theory only (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The aim of the course is to build up the knowledge among the students about the biodiversity of India and world and different conservation strategies used for preserving the biodiversity.

Course Outcomes:

By the end of the course the students will be able to:

CO1: Describe and Classify biodiversity, its types, status, hotspot and its conservation status. **[BT1 and BT2].**

CO3: Identify and categorize the plant under the different categories of threat.**[BT4]**

CO2: Evaluate strategies for biodiversity conservation. **[BT4]**

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PAPER III: HERBAL TECHNOLOGY

SUBJECT CODE: BOT144D203,

CREDIT UNITS: L-T-P-C = 3-0-0-3

SCHEME OF EVALUATION: Theory (T)

[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The course is designed with an objectives to identify plants of medicinal values that can be used using modern techniques in the field of medicine.

Course Outcomes:

By the end of the syllabus the student will be able to:

Detailed Syllabus:

CO1: List out the different areas in the field of herbal medicine, the distribution profile of Indian medicinal plants and its diversity hotspot. **[BT1].**

CO2: Generalize and interpret the medicinal values of a plant based on its phytochemical profile **[BT2 & BT3]**

CO3: Outline the post-harvest technology of medicinal plants. **[BT4]**

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3RD SEMESTER SYLLABUS

CORE PAPERS (ALL COMPULSORY)

PAPER I: ANGIOSPERM ANATOMY & EMBRYOLOGY
SUBJECT CODE: BOT144C204,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory Papers (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course objectives:

This course aims to impart an insight into the internal structure and reproduction of the most evolved group of plants, the Angiosperm. It will help the student to Identify role of anatomy in solving taxonomic and phylogenetic problems.

Course outcomes:

On completion of this course the students will be able to:

CO1: Describe and explain the structure and structural adaptations of plants with respect to diverse environmental conditions. **[BT1 & BT2].**

CO2:Explain the various events which are met in during the sexual reproduction of angiosperm plants. **[BT2].**

CO3: Relate and breakdown the utility of embryological characters for the study of plant systematics. **[BT3 & BT4]**

PAPER II: PLANT BIOCHEMISTRY & MOLECULAR BIOLOGY
SUBJECT CODE: BOT144D302,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three): Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The courseis devised to help students understand the concept of molecular biology: understanding the process of replication, transcription and translation and learning how these are regulated

Course Outcomes:

On completion of the course the student will be able to:

CO1: Reproduce and explainthe study of chemical processes within and relating to living organisms. **[BT1&BT2]**

CO2: Summarize the Central Dogma of life and understand its regulatory aspect. **[BT2]**

CO3: Predict and identify the key regulators that is involved in controlling information flow through biochemical processes and signaling that give rise to the complexity of life. **[BT3 & BT4]**

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DISCIPLINE SPECIFIC ELECTIVE PAPERS (Any 1 papers to be selected)

SPECIAL PAPER I: MICROBIOLOGY I
SUBJECT CODE: BOT144D302
CREDIT UNITS: L-T-P-C = 2-0-2-3
SCHEME OF EVALUATION: THEORY & PRACTICAL (TP)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Lab Experiment, Copy and Viva (Any Three), Mid-term examination: 10%, Attendance: 5%, Semester End Examination: 70%]

Course Objectives:

The course is designed to enable the students understand the microbial worldand to learn about the role of microbes in day to day processes of the physical world

Course Outcomes:

CO1: **Recognise** the role of microbes in the environment and its role in biogeochemical cycles, food and industrial sector. **[BT2].**

CO2: **Evaluate and identify** the class of microorganisms that can be used for the production of high-value products such as drugs, chemicals, fuels and electricity. **[BT2-BT4]**

DSE II: ADVANCED PLANT PHYSIOLOGY & BIOCHEMISTRY I
SUBJECT CODE: BOT144D302
CREDIT UNITS: L-T-P-C = 2-0-2-3
SCHEME OF EVALUATION: Theory & Practical (TP)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Lab Experiment, Copy and Viva (Any Three), Mid-term examination: 10%, Attendance: 5%, Semester End Examination: 70%]

Course objectives:

The course is to acquaint the students with the various physiological processes inside the plant body and to help them understand the functions of various hormones as well as pigments present in plants.

Course outcomes:

On completion of this course the students will have be able to:

CO1:Summarise different physiological processes of plants. **[BT2]**

CO2:Identify and interpret the different factors effecting the physiological process.**[BT3 and BT4]**

CO3:Estimate the antioxidant activity of plants.[**BT4]**

CO4: Perform various biochemistry experimets. **[BT4]**

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DSE III ANGIOSPERM TAXONOMY I
SUBJECT CODE: BOT144D303
CREDIT UNITS: L-T-P-C = 2-0-2-3
SCHEME OF EVALUATION: THEORY & PRACTICAL (TP)
Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Lab Experiment, Copy and Viva (Any Three), Mid-term examination: 10%, Attendance: 5%, Semester End Examination: 70%

Course Objective:

The course is designed with the following objectives to help students learn about the historical development of plant taxonomy, classification and diversity of the plant kingdom. The course will deliver the knowledge about the systematic tools used in the classification of plants at cellular and molecular level.

Course Outcomes:

CO1: **Outline and classify** the history, origin, and diversity of plant classification and distribution.**[BT1 & BT2]**
CO2: **Predict** the evolutionary changes in angiosperms. **[BT3]**

CO3: **Categorize** medicinal plants that can be used in research and forensic science.**[BT4]**

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4TH SEMESTER SYLLABUS

CORE PAPERS (ALL COMPULSORY)

PAPER I: PLANT ECOLOGY AND ENVIRONMENT
SUBJECT CODE: BOT144C301
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: THEORY (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objectives:

The course is to acquaint the students about the environment and plant interactions and to impart a concept on biogeography and traditional knowledge in botany.

Course Outcomes:

On completion of the course, the students will be able to:

CO1: **Describe and discuss** about the role of plants in the environment, the concept of biogeochemical cycles and its role in the environment. **[BT1 & BT2].**
CO2: **Outline** the eco-restoration strategies. **[BT3 & BT4].**
CO3: **Examine** the relationships of plants with the physical and biotic environment.**[BT4].**

PAPER II: BIOSTATISTICS AND BIOINFORMATICS
SUBJECT CODE: BOT144C402,
CREDIT UNITS: L-T-P-C = 4-0-0-4
SCHEME OF EVALUATION: Theory (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three); Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course Objective:

The course is designed to apply programming language to understand biological data.

Course Outcomes:

By the end of the course the students will be able to:
CO1:Outline and describe the basic concepts of Bioinformatics and its significance in Biological data analysis. **[BT1 &BT2]**
CO2:Compute and model out various bioinformatic too to decipher the structural organisation, structural properties and structure determination of biological macromolecules – DNA, Protein and Carbohydrates. **[BT3 & BT4]**
CO3: Interpret and demonstrate statistical reasoning skills accurately and contextually. **[BT3]**
CO4: Apply statistical knowledge to design and **conduct** research studies and also Operate statistical software packages to conduct research studies. **[BT3 & BT4]**

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PAPER III: PLANT ECOLOGY, ENVIRONMENT, BIOSTATISCS & BIOINFORMATICS (PRACTICAL)

SUBJECT CODE: BOT144C413

CREDIT UNITS: 0-0-8-4

SCHEME OF EVALUATION: Practical (P)

[Continuous Evaluation: 25%: Skill Test, lab copy, viva, lab involvement (Any Three) Attendance: 5%, Semester End Examination: 70%]

Course objectives:

To introduce the students to the world of microbes and the methods involved in microbiology and molecular biology by showing them live cultures and photographs of bacteria and viruses.

Course Outcomes:

By the end of the course, the students will be able to:

CO2:Perform hands-on-experiment on different laboratory experiments related to ecology, bioinformatics and biostatics. **[BT3]**

CO2:Compute and interpret the results and correlate the data for its application to research studies.**[BT3 & BT4]**

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PAPER I: MICROBIOLOGY II
SUBJECT CODE: BOT144D401
CREDIT UNITS: L-T-P-C = 3-0-2-4
SCHEME OF EVALUATION: THEORY & PRACTICAL (TP)
Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Lab Experiment, Copy and Viva (Any Three), Mid-term examination: 10%, Attendance: 5%, Semester End Examination: 70%

Course Objective:

To enable the students understand the microbial world of food. To learn about thephysiological functional of microbes.

Course Outcomes:

By the end of the course, the students will be able to:

CO1:Describe and discuss microbial genomics, microbes induced immune response and the application of microbes in the field of food spoilage and preservation. **[BT1 and BT2]**
CO2:Apply the knowledge obtained to select the correct micro-organism(s) for the production of value-added products. **[BT3 and BT4].**

PAPER II: ADVANCED PLANT PHYSIOLOGY& BIOCHEMISTRY II
SUBJECT CODE: BOT144D402
CREDIT UNITS: L-T-P-C = 3-0-2-4
SCHEME OF EVALUATION: Theory &practical (TP)

Course objectives:

The course is designed to acquaint the students with the various molecular physiological & biochemical processes inside the plant body and to help thwmunderstand the application of different techniques used in advance plant physiology.

Course outcomes:

By the end of the course, the students will be able to:

CO1: List out the various biotic and abiotic stresses and interpret the mechanism induced by the plant to resist stress. **[BT2]**
CO2:Discuss about the mechanism of action of: Triacontanol, Brassins, Salicylic acid, Jasmonates and Polyamines in plant growth and development.
CO3: Identify the key regulating points of different processes that can be targeted for enhancing the plant trait and yield. **[BT4].**
CO4: Identity the molecular tools that can be used to conduct plant physiology research. **[BT4].**

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PAPER III: ANGIOSPERM TAXONOMY II
SUBJECT CODE: BOT144D403
CREDIT UNITS: L-T-P-C = 3-0-2-1
SCHEME OF EVALUATION: THEORY (T)
[Continuous Evaluation: 15%, Assignment, Class Test, Seminar, Quiz (Any three): Mid-term Examination: 10%; Attendance:5%; Semester End Examination: 70%]

Course objectives:

The course is designed to acquaint the students with the various molecular physiological & biochemical processes inside the plant body and to help thwm understand the application of different techniques used in advance plant physiology.

Course Outcome:

CO1: **Describe** the origin, and diversity of angiosperms, sources of taxonomic literature and plant identification. [**BT2**]

CO2: **Make** herbarium sheets of some of the important plants. [**BT4**]

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Royal School of Travel & Tourism Management (RSTTM)

Learning Outcomes-based Curriculum Framework

(LOCF)

Masters in Travel & Tourism Management

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SYLLABUS (1st SEMESTER)

Subject Name: Fundamentals of Tourism **Subject Code: TTM204C101**		
L-T-P-C – 4-0-0-4	**Credit Units:4**	**Scheme of Evaluation: (T)**

Course Objective: To make students aware of different components of tourism and general impacts of tourism on social, cultural and economic perspective.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To recall** the basic knowledge of Tourism fundamentals
LO 2 **To outline** the concepts of different forms of Tourism
LO 3 **To identify** the positive and negative impacts of Tourism
LO 4 **To apply** Tourism statistics theories

SYLLABUS (1st SEMESTER)

Subject Name: Destination Geography, History and Heritage **Subject Code: TTM204C102**		
L-T-P-C – 4-0-0-4	**Credit Units:4**	**Scheme of Evaluation: (T)**

Course Objective: To make students aware about the geography of tourism along with history and tourism resources.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the basic knowledge of elements of geography
LO 2 **To explain** the different forms of Tourism resources
LO 3 **To identify** the different national and international tourist destinations LO 4 **To plan** field trips on tourist destinations and have first-hand ground level.

SYLLABUS (1ST SEMESTER)

Subject Name: Fundamentals of Management **Subject Code: TTM204C103**		
L-T-P-C – 4-0-0-4	**Credit Units: 04**	**Scheme of Evaluation: (THEORY)**

Course Objective: To make students aware of the fundamentals of management and also to make them understand the different structure of an organization and different theories of motivation.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the basic knowledge of management fundamentals.
LO 2 **To classify** the concepts of different structures of an organization
LO 3 **To illustrate** the dynamics of planning, controlling and strategies
LO 4 **To identify** the meaning & importance of motivation.

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SYLLABUS (1st SEMESTER)

Subject Name: Tourism and Travel Industry
Subject Code: TTM204C104

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of the different components of the Tourism and Travel Industry with special reference to transportation forms and agencies

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To recall** the basic knowledge of the Travel market
LO 2 **To interpret** the details of Transport Services of Tourism industry
LO 3 **To identify** the major organizations in the Global Travel Industry

SYLLABUS (1st SEMESTER)

Subject Name: Destination Planning and Management
Subject Code: TTM204D101

L-T-P-C – 3-0-0-3 **Credit Units:3** **Scheme of Evaluation: (T)**

Course Objective: To make students aware about the various fundamentals associated in Destination Planning and Management

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To name** various forms of Destinations
LO 2 **To explain** the various levels of Tourism Planning and Development
LO 3 **To outline** the 6 A's framework for Tourist Destinations
LO 4 **To develop** strategies for Destination Promotion and Publicity

SYLLABUS (1st SEMESTER)

Subject Name: International Tourism
Subject Code: TTM204D102

L-T-P-C – 3-0-0-3 **Credit Units: 3** **Scheme of Evaluation: (T)**

Course Objective: This paper aims at providing an overview of global tourism trends along with major places of tourist. Importance in different continents.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To name** various forms of Destinations
LO 2 **To explain** the various tourism destinations in Asia and Europe
LO 3 **To identify** various tourism destinations in North and Americas, Africa and Australia

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SYLLABUS (2nd SEMESTER)

Subject Name: Human Resource Management & Organizational Behavior

Subject Code: TTM204C204

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of role and importance of Human Resource Management and Organizational Behaviour in structuring Tourism organizations

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To omit** basic Concept of HRM
LO 2 **To explain** the structure of the HRM in Tourism organization
LO 3 **To recall** the Recruitment and Selection process
LO 4 **To identify** the Performance monitoring and Appraisal methods for employees

SYLLABUS (2nd SEMESTER)

Subject Name: Travel Agency and Tour Operation
Subject Code: TTM204C205

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make the students aware of the role of Travel Agency and Tour Operators in the tourism business.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concept of Tourism Intermediaries and their Role
LO 2 **To outline** the Job descriptions of a Travel Agency
LO 3 **To show** the operations of a Tour Operator
LO 4 **To identify** various International and National level Tourism related Organization

SYLLABUS (2nd SEMESTER)

Subject Name: Sustainable Tourism
Subject Code: TTM204D201

L-T-P-C – 3-0-0-3 **Credit Units: 3** **Scheme of Evaluation: (T)**

Course Objective: To make the students aware of the role of Travel Agency and Tour Operators in the tourism business.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concepts and principles of Sustainable Tourism
LO 2 **To explain** the Environment and Ecosystem
LO 3 **To identify** the Sustainable Tourism Initiatives
LO 4 **To identify** the business of Ecotourism

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SYLLABUS (2nd SEMESTER)

Subject Name: **Special Interest Tourism**
Subject Code: **TTM204D202**

L-T-P-C – 3-0-0-3 **Credit Units: 3** **Scheme of Evaluation: (T)**

Course Objective: To familiarize with special interest tourism concept; ecotourism, sports tourism, adventure tourism; and to give insights into functioning of SIT

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concepts and principles Special Interest Tourism
LO 2 **To explain** about Health & Wellness tourism, Adventure Tourism, Rural Tourism
LO 3 **To Identify** various emerging special interest areas

SYLLABUS (3rd SEMESTER)

Subject Name: **Research Methods**
Subject Code: **TTM204C301**

L-T-P-C – 3-0-1-4 **Credit Units:4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of the different components of Research Methodology

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the basic concept of Research Methods
LO 2 **To find** the Sources of Data Collection
LO 3 **To explain** the Technique of Sampling
LO 4 **To identify** the Quantitative and Qualitative Data Analysis

SYLLABUS (3rd SEMESTER)

Subject Name: **Tourism Entrepreneurship**
Subject Code: **TTM204C302**
L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of the dynamics of entrepreneurship and its various characteristics

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concept of Entrepreneurship
LO 2 **To classify** the characteristics of an entrepreneur
LO 3 **To identify** the Entrepreneurial process
LO 4 **To analyse** Business Plan for a Tourism Project.

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SYLLABUS (3rd SEMESTER)

Subject Name: Tourism Geography & Ecology
Subject Code: TTM204C303

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: This course explores the basic components of geography in relation with tourism, Knowledge of geography shall also give an extra edge to the students in designing the itineraries for the Travelers and suggesting them various destinations.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the basic concept of Geography of tourism regions
LO 2 **To explain** the designing dynamics of Itineraries
LO 3 **To identify** various related tourism destinations

SYLLABUS (3rd SEMESTER)

Subject Name: Legal and Ethical Issues in Tourism
Subject Code: TTM204D301

L-T-P-C – 3-0-0-3 **Credit Units: 3** **Scheme of Evaluation: T**

Course Objective: To make students aware of the legal and ethical issues in Tourism Industry

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To find** the basic Legal and Ethical Issues in Tourism
LO 2 **To explain** the Political Institutions and Legislatures
LO 3 **To identify** the Laws related to Accommodation

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SYLLABUS (3rd SEMESTER)

Subject Name: Tourism in Northeast India
Subject Code: TTM20D305

L-T-P-C – 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:

The course aims to develop the knowledge of the students about the rich potential tourism resources of the northeast part of India.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To find** the tourism index in context to tourist arrivals in India
LO 2 **To explain** about the fairs and festivals of North East India
LO 3 **To identify** various wildlife as well as religious tourism destinations of North East India

SYLLABUS (3rd SEMESTER)

Subject Name: Typology of Tourist Behavior and Cross-Cultural Management

Subject Code: TTM204D304

L-T-P-C – 3-0-0-3 **Credit Units: 3** **Scheme of Evaluation: (T)**

Course Objective:
The course aims to develop the knowledge of the students about typology of general tourist behaviour along with the management related to cross-cultural effect of tourism.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To omit** the concept of tourist behaviour and culture
LO 2 **To explain** the theoretical framework of culture
LO 3 **To identify** various typologies of tourist behaviour
LO 4 **To discover** the impacts of interaction between host community and tourists

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SYLLABUS (4th SEMESTER)

Subject Name: Tourist Behavior
Subject Code: TTM204C404

L-T-P-C – 3-1-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective:
The course aims to develop the knowledge of the students about the rich potential tourism resources of the northeast part of India.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To find** the major influences in decision making by tourists.
LO 2 **To interpret** different psychological factors that influence tourist behaviour.
LO 3 **To identify** the relevance of tourist behaviour theories and concepts to marketing decisions.
LO 4 **To analyse** different market segments on the basis of different psychological factors of tourists and develop marketing strategies.

SYLLABUS (4th SEMESTER)

Subject Name: Hospitality Management
Subject Code: TTM204C402

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: The course aims to develop the knowledge on the importance of hospitality in the tourism sector.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concept of hospitality
LO 2 **To Explain** about Rooms Division of a hotel
LO 3 **To identify** various forms of F&B operations

SYLLABUS (4th SEMESTER)

Subject Name: Cultural & Heritage Tourism
Subject Code: TTM204C403

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: The main objective of the course is to provide a comprehensive view of culture- heritage tourism relationship to the students and to acquaint them with the possible impacts arising in that relationship. The Indian culture and heritage shall be taught with the purpose of application of the same in tourism sector.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the basic concept of culture & heritage tourism
LO 2 **To outline** the structure of the religious and pilgrimage sites
LO 3 **To identify** the UNESCO criteria structure

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SYLLABUS (4th SEMESTER)

Subject Name: MICE Management
Subject Code TTM204D401

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of the concept of MICE tourism and its components.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concept of MICE Tourism
LO 2 **To explain** the principal suppliers for MICE Tourism
LO 3 **To identify** the role played by Travel Agencies or Tour Operators
LO 4 **To analyse** the role of Information Technology in MICE Tourism

SYLLABUS (4th SEMESTER)

Subject Name: Hotel & Resort Management
Subject Code: TTM204D402

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: This Module is prescribed to appraise students about the important departments of a classified hotel and to teach various aspects related to accommodation Industry

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To recall** the origin of hotels
LO 2 **To explain** the requirement of hotel classifications
LO 3 **To identify** the concept of resort and resort planning

SYLLABUS (4th SEMESTER)

Subject Name: Retail Management
Subject Code: TTM204D403

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: The objectives of the course are to explain the basic concepts of Retail Management, along with Market Segmentation and Strategies.

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the dynamics of Retail Management
LO 2 **To explain** the Retail Market segmentations
LO 3 **To identify** the Merchandising Management
LO 4 **To identify** the Retail Space Management

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SYLLABUS (4th SEMESTER)

Subject Name: Airfare & Ticketing
Subject Code: TTM204D404

L-T-P-C – 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: (T)**

Course Objective: To make students aware of aviation geography and airfare ticketing

Learning Outcomes:
Having successfully completed this module, a student will be able –

LO 1 **To define** the concept of aviation geography and the aviation industry
LO 2 **To explain** the concepts of ticketing
LO 3 **To identify** the airline and airfare terminology
LO 4 **To identify** the nuances of airline routing, airfare construction and handling ticketing.

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ROYAL SCHOOL OF INFORMATION TECHNOLOGY(RSIT)

Learning Outcomes based Curriculum Framework (LOCF)

2021-22

SYLLABUS

&

COURSE STRUCTURE

M. Sc.IT

Anuradha Devi

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Programme Learning Outcomes

These outcomes describe what students are expected to know and be able to do by the time of graduation. They relate to the skills, knowledge, and behaviors that students acquire in their graduation through the program. The Master Degree of Science in Information Technology program enables students to attain, by the time of graduation followings

- Demonstrate the aptitude of Computer Programming and Computer based problem solving skills.
- Display the knowledge of appropriate theory, practices and tools for the specification, design, implementation
- Ability to learn and acquire knowledge through online courses available at different
- Ability to link knowledge of Computer Science with other two chosen auxiliary disciplines of study.
- Display ethical code of conduct in usage of Internet and Cyber systems.
- Ability to pursue higher studies of specialization and to take up technical employment.
- Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
- Ability to operate, manage, deploy, configure computer network, hardware, software operation of an organization.
- Ability to present results using different presentation tools.
- Apply standard Software Engineering practices and strategies in real-time software project development
- Design and develop computer programs/computer-based systems in the areas related to algorithms, web design, cloud computing and data analytics.

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Paper I/Subject Name: Advanced Database Management Systems

Learning Outcomes
• Learn about basic database related concepts. • Have an insight on Relational Database Modeling and the Structured Query Language. • Learn about Database Design including Normalization and Functional Dependencies. • Have the understanding of the advanced topics like Query Optimization, Transaction Processing

Paper II/Subject Name: Data Structures using C++

Learning Outcomes
•Have the understanding the data structures, their advantages and drawbacks, how to implement them in C++ & how they can be overcome. •Have the understanding their applications and their uses. •Have an idea of about the datastructure methods or algorithms mentioned in the course so as to make use of them in a program to enhance their efficiency

Paper III/Subject Name: Object Oriented Programming and Design

Learning Outcomes
•Learn the basic concepts ofobject oriented paradigm. •Understand concepts on Object-Oriented Modelling using UML diagrams.

Paper IV/Subject Name: Advanced Computer Organization and Architecture

Learning Outcomes
•Understand overview of Computer Organization and Architecture. •Define Computer System and Components •To give students detailed concepts on the Central Processing Unit. •To give students exposure to Multicore computing and Parallel Organization of Computers

Paper V/Subject Name: Advanced Database Management Systems Lab

Learning Outcomes
• Learn Data Modeling through various diagrams • Learn and Practice different Structured Query language. • Gain knowledge on query processing and optimization • Able to create small DBMS systems

Paper VI/Subject Name: Data Structures using C++Lab

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Learning Outcomes
• Learn theimplementation of various datastructures through C++. • Understand theapplications and uses of data structures in real world. • Learn to analyze the efficiency of algorithms.

Paper VII/Subject Name: Object Oriented Programming and Design Lab

Learning Outcomes
•Learn programming through C++. •Learn data modelling through UML diagrams. •Be able to differentiate between procedural and object-oriented programming paradigm.

Paper IX/Subject Name: Communication: Skills, Concepts and Applications

Learning Outcomes
Be familiar with the basics ofwriting, speaking and group communication.

Paper X/Subject Name: Fundamentals of Organizational Behaviour

Learning Outcomes
Have a better understanding of organizational behavior and insight into the vital parts of an organization,namely, communication and culture.

Detailed Syllabus of Semester II

Paper I/Subject Name: Computer Networks

Learning Outcomes
• Independently understand basic computer network technology and identify the different types of network topologies and protocols. • Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of eachlayer. • Identify the differenttypes of network devices andtheir functions within a network • Understand and building the skills of subnettingand routing mechanisms. • Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Paper II/Subject Name: Web Technologies

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Learning Outcomes
• Analyze a web page and identify its elements andattributes. • Create web pages usingHTML and Cascading Style Sheets. • Build dynamic web pages using JavaScript (Clientside programming). • Create XML documentsand Schemas. • Build interactive webapplications using AJAX.

Paper III/Subject Name: Modern Operating Systems

Learning Outcomes
• Learn the fundamentals of Operating Systems and the mechanisms of OS to handle processes and threads and theircommunication. • Learn the mechanisms involved in memory management in contemporaryOS. • Gain knowledge on distributedoperating system concepts thatincludes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols. • Know the components andmanagement aspects of concurrency management. • Learn programmatically toimplement simple OS • mechanisms.

Paper IV/Subject Name: Multimedia Theory and Applications

Learning Outcomes
• Developed understanding of technical aspect of Multimedia Systems. • Understand various fileformats for audio, video and text media. • Apply various networking protocols formultimedia applications. • To evaluate multimedia application for itsoptimum performance

Paper V/Subject Name: Computer Networks Lab

Learning Outcomes
• Know about different Networkcomponents. • Learn about client-serverprogramming • Learn and differentiate between TCP and UDP servers • Learn about networksimulators.

Paper VI/Subject Name: Web Technologies Lab

Learning Outcomes
• Learn web page designing indetail using various client side and server side scripting. • Learn CSS. • Understand the development of XML documents. • Know about AJAX

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Paper VII/Subject Name: Modern Operating System Lab

Learning Outcomes
• Learn ShellScripting. • To performscheduling operations on theOS. • Learn the use ofsystem calls. • Understand practically aboutthreads, processsynchronization, deadlocks, etc.

Paper X/Subject Name: Business Environment and Communication

Learning Outcomes
• Know communication skills required in corporation and work as a team, comprehend cross cultural communicationand improve their technical writing skills.

Paper XI/Subject Name: Individual and Intrapersonal Behaviour

Learning Outcomes
• Understand individual and interpersonal behavior within an organization, thus building insight into the dynamics of employeeattitudes, satisfaction, conflict and power politics.

Detailed Syllabus of Semester-III

Paper I/Subject Name: Design &Analysis of Algorithms

Learning Outcomes
• Describe the major modern algorithms and selected techniques that are essential totoday's computers. • Decide on the suitability of a specific algorithm design technique for a given problem. • Apply the algorithms and design techniques to solve problems, and mathematicallyevaluate the quality of the solutions.

Paper II/Subject Name: Compiler Design

Learning Outcomes
• Have a practical introductionto the basic concepts of Compiler Design. • Have practical exposure to theconcepts of syntax analysis. • Have detailed practical concepts on various kinds ofparsing. • Have detailed hands-on concepts on machine codegeneration.

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Paper III/Subject Name: Design &Analysis of Algorithm Lab

Learning Outcomes
• Describe the major modernalgorithms and selected techniques that are essential totoday's computers. • Decide on the suitability of aspecific algorithm design technique for a given problem. • Apply the algorithms anddesign techniques to solve problems, and mathematicallyevaluate the quality of the solutions.

Paper IV/Subject Name: Compiler Design Lab

Learning Outcomes
• Have a practical introduction to the basic concepts of Compiler Design. • Have practical exposure tothe concepts of syntax analysis. • Have detailed practical concepts on various kinds of parsing. • Have detailed hands-on concepts on machine code generation.

Paper VII/Subject Name: Kinesics and Effective Communication

Learning Outcomes
Have a sound knowledge of non-verbal communication and develop skills like Conversation, Group discussions and Reading skills

Detailed Syllabus of Semester-IV

Paper I/Subject Name: Soft Computing

Learning Outcomes
• Discuss the ideas of fuzzy sets, fuzzy logicand use of heuristics based on human experience • Relate with neural networks that can learn from available examples and generalize to form appropriate rules forinference systems • Describe with geneticalgorithms and otherrandom search procedures useful while seeking global optimum in self- learning situations • Develop some familiarity with current research problems and researchmethods in Soft Computing Techniques.

Paper II/Subject Name: Cryptography and Network Security

Learning Outcomes
• Grasp complete knowledge ofvarious issues in the network. • Solve problems based on symmetric and asymmetriccryptography techniques. • Have network managementcapabilities.

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Paper V/Subject Name: Advance Corporate Communication

Learning Outcomes
• Have a sound understanding of Negotiation skills, Organizational outcomeslike conducting meetings writing Business Proposals andPlans.

Paper VIII/Subject Name: Theory of Computation

Learning Outcomes
• Analyse and design finite automata, pushdown automata,Turing machines, formal languages, and grammars. • Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving. • Prove the basic results of theTheory of Computation.

Paper VIII/Subject Name: Graph Theory

Learning Outcomes
• To explain and apply principles and concepts ofgraph theory in practical situations • To apply the basic concepts ofmathematical logic • To describe and solve somereal time problems using concepts of graph theory.

Paper VIII/Subject Name: Digital Image Processing

Learning Outcomes
• Learn the fundamentalconcepts of a digital image processing system. • Analyze images in thefrequency domain using various transforms. • Evaluate the techniques for image enhancement and image restoration. • Categorize various compression techniques. • Interpret Image compression standards, image segmentationand representation techniques.

Paper VIII/ Subject Name: Data Warehousing

Learning Outcomes
• Have a deeper understanding ofdatabase systems and their underlying theory • To be able to improvethe decision-making process. • Understand thetechnology of data warehousing. • Be able to develop applications of higher order database systems

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Paper V/Subject Name: Distributed Operating Systems

Learning Outcomes
• To identify the core concepts of distributed systems: the wayin which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way. • To examine how existing systems have applied the concepts of distributed systemsin designing large systems.

Paper V/Subject Name: Artificial Intelligence

Learning Outcomes
• Understand the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic,and learning. • Have read and analyzed important historical and current trends addressingartificial intelligence.

Paper V/Subject Name: Wireless Computing

Learning Outcomes
• Understand the basic conceptsof mobile computing and the network protocol stack. • Learn the basics of mobile telecommunication system andAd-Hoc networks. • Gain knowledge about different mobile platforms andapplication development

Paper V/Subject Name: Cloud Computing

Learning Outcomes
• Understand the fundamentalprinciples of distributed computing • Understand the importance ofvirtualization in distributed computing and how this has enabled the development of Cloud Computing • Understand the business models that underlie CloudComputing. • Understand concepts of IAAS,SASS, PAAS

Paper V/Subject Name: Cyber Forensics

Learning Outcomes
• Understand the definition ofcomputer forensics fundamentals. • Describe the types of computer forensics technology. • Analyze various computerforensics systems. • Illustrate the methods for datarecovery, evidence collection and data seizure. • Summarize duplication andpreservation of digital evidence.

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Paper V/Subject Name: Pattern Recognition

- Learn the design and construction and a pattern recognition system
- Understand the working knowledge of implementing pattern recognition techniques and the scientific Python computing environment.
- Analyze the different features extracted from datasets

Paper III/Subject Name: Big Data Analytics

Learning Outcomes
• Identify Big Data and itsBusiness Implications. • List the components of Hadoop and Hadoop Eco-System. • Access and Process Data onDistributed File System. • Manage Job Execution inHadoop Environment. • Develop Big Data Solutionsusing Hadoop Eco System. • Apply Machine LearningTechniques using R.

Paper V/Subject Name: Bioinformatics

- Develop bioinformatics tools with programming skills.
- Apply computational based solutions for biological perspectives.
- Practice life-long learning of applied biological science

Paper IV/Subject Name: Optimization Techniques

Learning Outcomes
• Formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods tosolve the problem. • Recall Formulae. • Demonstrate various principles involved in solvingmathematical problems and thereby reducing the time taken for performing job functions. • Interpret quantitative information (i.e., formulas,graphs, tables, models, andschematics) and draw implications from them. • Critically evaluate various reallife situations by resorting to analysis of key issues and factors.

Paper IV/Subject Name: Mobile Application development

Learning Outcomes
• Design and implement variousmobile applications using emulators. • Deploy applications to hand-held devices.

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Paper IV/Subject Name: Python Programming

Learning Outcomes
• Understand the modern version control tools with aLinux command line environment. • Understand the role of testing in scientific computing, and write unittests in Python. • Use command line tools towrite and edit code to perform mathematical calculations and scientific simulations. • Produce publication-readygraphics from a dataset.

Paper IV/Subject Name: Robotics

Learning Outcomes
• Learn about Robot cell designand applications • Know about Micro/Nanorobotic systems

Paper IV/Subject Name: Neural Networks and Fuzzy Logic

Learning Outcomes
• Know about different neuralnetworks, their architecture and training algorithm. • Learn the concept of Fuzzylogic, Fuzzy Sets, fuzzy rulesand fuzzy reasoning • Get exposed to the applicability of neural networksand fuzzy logic

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF BUSINESS
(RSB)

SYLLABUS

&

STRUCTURE

Master of Business Administration (MBA)

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK OF MASTER OF BUSINESS ADMINISTRATION (M.B.A.)

The Assam Royal Global University IQAC Estd : 2018

ACADEMIC YEAR: 2021-22

Anuradha Dey

Director, IQAC
The Assam Royal Global University

SYLLABUS (1st SEMESTER)

Paper: Management Process and Organizational Behavior — **Subject Code: BSA034C102**

L-T-P-C – 4-0-0-4 — **Credit Units: 4**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To impart the basic concepts of management and management theories • To increase one's ability to draw conclusions and develop inferences about attitudes and behavior, when confronted with different situations that are common in modern organizations	• Lecture • Assignment and problem solving • Individual /Group Presentation • Case Studies	• On completion of the course, the students will be able to know thebasicsofmanagem entpracticesandtheor ieswhichbuildthefoun dation.	• Continuous Evaluation:15% • (Assignment ,Class Test, Viva, Seminar, Quiz :Any Three) • Mid-term examination:10% • Attendance:5% • EndTermExamination: 70%

Paper: Accounting for Managers-I — **Subject Code: BSA034C102**

L-T-P-C – 4-0-0-4 — **Credit Units: 4**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To enable student to understand the basic concepts of financial accounting & impart them with required ability to prepare books of accounts. • To equip the studentswith methods and practices adopted inpreparation & presentation of financial statements • To lay a foundation for developing their skills in interpreting financial statements and to enable the students to take business decisions.	• Interactive Lectures • Case Study • Assignments • Practical problem solving • Individual/group presentation • Self learning materials & important links for self learning & updated knowledge of the subject	• On successful completion of this course students will gain sufficient knowledge of financial accounting preparation as well as presentation for reliable reporting of information to various stakeholders. Further, students will acquire sufficient knowledge and have ability to analyze financial statements for sound business decision making.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Marketing Management	Subject Code: BSA034C103
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The course will enable to have practical introduction to marketing management, will improve the ability to make effective marketing decisions, including assessing marketing opportunities and developin g marketing strategies and implementation plans.	• Lecture • Assignment • Case Study • Individual and Group Presentation	On completion of the course, the students will gain solid understanding of key marketing concepts and skills and perform situation analysis to assess market opportunities and develop marketing strategies to achieve company's objectives	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Managerial Economics	Subject Code: BSA034C104
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To make the student aware about economic concepts like supply, demand and related aspects • To enable the student to understand the concept about Production function and variables affecting production • To impart the knowledge about different types of markets and pricing decisions • Enable the student to understand the concept of game theory and its uses in business.	• Lecture • Assignment and problem solving • Individual /Group Presentation	• On completion of the course, the students will be able to understand the problems, issues and decisions that managers face in each of the functional areas of the organization as well as the strategic ones faced by general managers.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Data Analysis & Decision Tools	Subject Code: BSA034C105
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To help acquire basic mathematical skills needed to understand, analyse, and extract meaningful information from data and apply them in decision making. • To equip the students in understanding the basic statistical tools and further aid them in building decision models using spreadsheet and software packages. • To encourage students to use quantitative analysis in their work area.	• Lecture • Assignments • Case Study • Project Work • Tutorials	• On completion of the course, the students will be able to develop proficiency in summarizing and presenting data to their target audience. They would be able to apply descriptive and inferential statistics in relevant areas. They would also acquire the ability to identify opportunities for applying management science tools by utilizing their critical thinking and problem solving skills.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Venture Planning & Start-Ups	Subject Code: BSA034C106
L-T-P-C – 3-1-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To help students to develop an entrepreneurial mindset and also to gain an understanding of the entrepreneurial process through analysis of various situations. • To gain insights about the critical role of creativity and innovation to the development of new products and/ or services in entrepreneurial start-ups. • To understand the possible financing options. • To explore issues relating to the creation and management of Start-ups.	• Interactive Lecture series with case based discussions. • Group Discussions. • Indivdual/Group Presentation • Self learning materials & providing relevant links for further study.	• On successful completion of this course, students will be able to understand the distinctive nature of start-ups and related scaling up process.	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid- Term Examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Management Information System	Subject Code: BSA034C107
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To use information technology in the field of management for better decision making purposes. • To understand the importance of information systems and its impact in today's business world	• Lecture • Assignment • Case Study • Individual/Group Presentation • Simulation (with examples)	On completion of this course, the students will be able to • know about the importance of information systems and its strategic advantage for the business • know about the key business applications that are used by the business firms today for better decision making • understand the fundamentals for designing of information systems	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz ; Any Three) • Mid-Term Examination: 10% • Attendance:5% • End Term Examination:70%

Paper: Accounting for Managers - II	Subject Code: BSA034C202
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To familiarize students with different methods & techniques of cost and management accounting. • 2. To impart knowledge and skills among the students so that they are able to analyze and evaluate information for cost ascertainment, planning, control and decision making. • To impart sufficient knowledge necessary to understand relevance of standard costing , budgeting and computing variances to undertake performance evaluation	• Interactive lecture with case based discussions on situations. • Case Study • Assignments • Practical Problem solving • Individual/ Group Presentation • Group Discussions.	• On completion of the course, the students will acquire sound knowledge about product/ service costing. Also, students will be able to interpret cost accounting statementsfor proper cost ascertainment, cost control & cost reduction. Further, they will be able to analyze accounting data for managerial decision making.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Corporate Finance	Subject Code: BSA034C203
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To provide a robust financial decision making framework regarding Corporate Financial problems. • To equip students with the tools to analyze and solve problems related to sourcing capital, Strategic Investment, Dividend decisions and Working Capital management. • To develop among the students ability to use the results from their analysis to make sound financial decisions. • To impart knowledge, skills and ability to do financial statements analysis and applications of Emerging tools of measuring Financial performance for sound business decision making in today's Complex and Challenging Business Environment.	• Interactive Lecture with case based discussions on each topic. • Practice on Practical Problems to enhance computational skills. • Self learning through open online courses & other relevant links. • Assignment • Individual/Group Presentation • Group Discussions.	• On Completion of the course, the students will be able to apply knowledge gained and techniques learned of Corporate finance to the planning, operating and monitoring of the finance function in particular as well as the whole organization in general i.e. students will be able to apply the concepts, theories and techniques relating to corporate finance in real life situations. Further, students will learn to analyze and make business decisions with a focus on value creation/ wealth maximization.	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-Term Examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Supply Chain Management	Subject Code: BSA034C204
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objective of this course is to introduce the students to the key concepts and techniques that will allow to analyze, manage and improve supply chain processes for different industries and markets. At completion of this course, students will have the skills to assess supply chain performance and make recommendations to increase supply chain competitiveness	• Lecture • Assignment • Case Study • Individual and Group Presentation	Upon completion of the course, students should • Get an understanding of the individual processes of supply chain management and their interrelationships within individual companies and across the supply chain. • An understanding of the management components of supply chain management • An understanding of the tools and techniques useful in implementing supply chain management	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Global Business Environment	Subject Code: BSA034C205
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To make the student aware of the Global Business Opportunities, Issues and Challenges. • To make the student understand the International Institution framework for Trade. • To impart the knowledge of various elements of Global trade like marketing, finance, documentation, payment, risk management etc.	• Interactive Lectures through Power point presentation • Case Discussions and Analysis • Assignments/projects at Individual/Group level	• On completion of the course, the student will be able to understand the various facets of global Business; roles of various Institutions for international business and take management decisions concerning International business	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Business Research	Subject Code: BSA034C206
LT-P-C – 4-0-0-	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To impart the knowledge of research, types of research and research designs • To make the student aware about data sources, sampling , data collection and report writing in a research project	• Lecture • Assignment • Case Study • Individual and Group Presentation • Live Project • Practical on SPSS	• The students will be able understand the various problems which requires research assistance. They will be able to handle the data through the use of appropriate statistics and will be able draw meaningful conclusions	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Operations Management	Subject Code: BSA034C207
L-T-P-C – 4-0-0-4	Credit Units: 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
This course aims to improve students understanding of the concepts, principles, problems, and practices of operations management. Emphasis would be on managerial processes for effective operations in both goods-producing and service-rendering organization.	• Lecture • Assignment • Case Study • Individual/Group Presentation • Simulation (with examples)	On completion of this course, the students • Will have a fair understanding of the role Production/Operations Management plays in business processes • Will be familiarized with various production processes and service systems • Will be able to do quantitative analysis of problems arising in the management of operations	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid- Term Examination: 10% • Attendance:5% • End Term Examination:70%

SYLLABUS (3rdSEMESTER)

Paper: Strategic Management	Subject Code: BSA034C301
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To enable the student to gain an integrated approach on business environment. • The aim of this composite approach is to provide students with firm foundation for understanding of all main components of business decisions based on strategies adopted	• Lecture • Assignment • Case Study • Individual and Group Presentation Pre-Readings: Vision, Mission, Goals, Objectives, Industry Structure, Competitive Advantage, SWOT, Business Environment	• On completion of the course, the students will gain an insight to the basics of best practices and theories in regard to Internal Business Environment	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Decision Making and Optimisation L-T-P-C- 3-0-0-3		Subject Code: BAS034C302 Credit Units: 3	
Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
• This course aims to introduce students to use quantitative methods and techniques for effective decisions-making: model formulation and applications that are used in solving business decision problems.	• Lecture • Assignment • Case Study • Individual/Group Presentation • Simulation (with examples)	On completion of the course, the students will be able to • formulate a real-world problem as a mathematical programming model • understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz ; Any Three) • Mid- Term Examination: 10% • Attendance:5% • End Term Examination:70 %

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Paper: Legal Aspects of Business	Subject Code: BSA0324303
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcome	Course Evaluation
• To provide students increased knowledge concerning important legal issues in business so that business managers are able to take decisions which are in accordance with the law of the land. • To provide the students with an understanding about the basic nature of law, how it works, how it is used to settle disputes and how it affects business decision making. • To familiarize the students with the legal issues in business scenario. • To bring out the linkages between business law and fields like accounting, finance, marketing, information systems, economics among others.	• Interactive Lecture with relevant cases studies thereof. • Assignment • Individual/Group presentation • Group Discussions. • Self learning materials & important links for further studies besides books.	• Students will be able to understand legal implications of business transactions. Further, the course will enhance student growth in critical thinking and problem solving regarding legal issues by reviewing factual situations and applying sound legal reasoning to reach a conclusion. Moreover, Students will gain sufficient drafting skills on constructing legal agreements/ deeds etc.	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid- Term Examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Talent Acquisition and Management	Subject Code: BSA034D30H1
L-T-P-C – 3-0-0-3	Credit Units-3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• Understanding best HR practices for talent management and managing talent for teams and organizations. • To familiarize student with the latest developments in the field of performance management so that the learning can be utilized in the industry.	• Lectures • Assignments • Individual/Group projects/presentations • Case Study	• On completion of the course, the student will gain insight on importance of Performance Management in business and how it contributes to measure the overall performance of an organization.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Managing Industrial Relations	Subject Code: BSA034D30H2
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To familiarise thestudents with theunderstanding of industrial and labour related social security laws • To teach the student the application of IR in the organization to maintain employee relations	• Lectures • Assignments • Individual/ Group projects/ presentations • Case Study • Role plays • Quiz • Analysis of Relevant videos	• On completion of the course, the student will be exposed to a variety of IR situations and other related matters and equip them with the necessary tools to apply the law to a given a set of facts. The students will be familiarized with the administration of labour laws in India at the Central and State levels; and thus, enhance their understanding onfunctioning of labour related departments that enforce various labour laws in India	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar,Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Consumer Behaviour	Subject Code: BSA034D30M1
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To introduce the students to the concept of consumer behavior, how and why consumers make purchase decisions, how they think, feel and act before, during and after the purchase. • To equip the students to view marketing phenomena from a customer's perspective.	• Lectures • Assignments • Individual/Group projects/presentations • Quiz • Case Study	• Develop an understanding of factors that influence consumer buying behavior • Appreciate mental processes that precede the act of purchase • Learn how to base marketing decisions on consumer insights Understand the influence of socio-cultural factors on consumer behavior	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% 2. End Term Examination: 70%

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Paper: Digital Marketing	Subject Code: BSA034D30M2
L-T-P-C – 3-0-0-33	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To impart knowledge, concepts and skills needed in marketing through digital channels. • To familiarize the participants with the concepts and techniques applicable to digital marketing.	• Interactive Lectures • Case Study • Assignments • Individual/group presentation	• Appreciation of difference and similarities between non-digital and digital marketing • Understanding consumer behavior on digital media • Understanding the basics of digital marketing strategy • Understanding social media, web analytics	• Continuous Evaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-term examination: 10% • Attendance:5% • End TermExamination: 70%

Paper: Investment Analysis and Portfolio Management	Subject Code: BSA034D30F1
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To open up the vistas of various investment avenues to the students. • To enable the student to understand and evaluate the various investments on the basis of risk, return and other parameters • To equip the students with Valuation methods and tools to value equity and debt instruments • To enable the students to create efficient portfolios, to manage the same and to evaluate its performance over time.	• Interactive Lectures through Power point presentation • Case Discussions and Analysis • Learning through Massive open online courses • Assignments/projects at Individual/Group level	• The student will be able to understand and value different securities. They will also be able to construct and manage his/her own portfolio as well as that of clients.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: The Indian Financial System	Subject Code: BSA034D30F2
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To Introduce the different aspects and Components of the Indian Financial System and its evolution to the student. • To impart the knowledge of Financial Markets, Financial Institutions and Financial Services to the student. • To enable the student to conceptualise t he interrelated linkages between various parts of the Financial System.	• Interactive Lecture with on each topic. • Insights on the path of Evolution of Financial Markets, Institutions and Services • Self learning through open online courses & other relevant links. • Assignment • Individual/Group Presentation • Group Discussions.	• On Completion of the course, the students will be able to understand the intricate details of the Indian Financial System and its components. • To understand the process of money movement between various players in the Financial System • To understand the need and functions of the Regulators of the Financial System : RBI and SEBI	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-Term Examination: 10% • Attendance: 5% • End Term Examination: 70%

Paper: Managing Start-ups	Subject Code: BSA034D30E1
LT-P-C-3-0-0-3	CreditUnits:3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To explore issues relating to the creation and management of startups • The objective is to develop entrepreneurial skills as well as digital and linguistic competencies	• Lecture • Assignment • Case Study • Team learning • Brainstorming • Individual and Group Presentation • Live Project • Use of web-based audio/visual materials.	• On completion of the course, the students will be able to understand the distinctive nature of startups. • Examine the ideation process. • Understand how the prototype model is tested • Understand the possible financing options • Understand the scaling up process	• ContinuousEvaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-termexamination: 10% • Attendance:5% • End TermExamination :70%

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Paper: Entrepreneurship, Creativity And Innovation	Subject Code: BSA034D30E2
LT-P-C-3-0-0-3	CreditUnits:3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• The objective of this course is to help the students to develop an entrepreneurial mind set • To gain an understanding of the entire entrepreneurial process through analysis of various situations. • To gain insights about the critical role of creativity and innovation to the development of new products and services in entrepreneurial start-ups	• Lecture • Assignment • Case Study • Team learning • Brain storming • Individual and Group Presentation • Live Project • Use of web-based audio/visual materials.	• On completion of the course, the students will be able to understand the meaning and significance of entrepreneurship and understand the process of entrepreneurial action. • Understand the entrepreneurial mindset and personality. • Understand the importance of idea generation, identifying opportunities and the value of a business plan. • Understand the role of creativity and innovation in entrepreneurship • Examine strategies for growth and identify the human resource challenges for managing growth.	• ContinuousEvaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-termexamination: 10% • Attendance:5% • End TermExamination :70%

Paper: Project Planning Analysis and Management	Subject Code: BSA032C401
L-T-P-C- 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To guide students through fundamental project management concepts and behavioral skills needed to successfully launch, lead, and realize benefits from projects in profit and non profit organizations • To guide the students about how successful project managers skillfully manage their resources, schedules, risks, and scope to produce a desired outcome.	• Lecture • Assignment • Case Study • Individual and Group Presentation	Upon completion of the course, students should be able to initiate and manage projects efficiently and effectively. They will learn key project management skills and strategies, and will have the opportunity to apply this knowledge through assignments.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination:70%

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Paper: Business Ethics and Sustainability	Subject Code: BSA034C402
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To understand concepts of corporate governance and corporate social responsibility. It aims at development of a sound understanding of corporate governance, practice in a national and international context and industries; integrate corporate governance aspects, economic viability and social and environmental impacts management outcome.	• Lectures • Assignments • Group discussions • Case Studies Pre-readings: Ethics, Moral Standards, Employee Interest, Social Responsibility, Corporate Structure, Environmental issues in India	On completion of the course • The student should be able to integrate theoretical knowledge and practical knowledge • The Student shall be able to assess the CSR Scenario, its mechanism & trends-Globally & Indian perspective.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination

Paper: Compensation	Subject Code: BSA034D40H1
L-T-P-C – 3-0-	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To teach the students the basic concepts of wages and salary management. • To make the students learn the types of compensation and the applications of compensation management.	• Lectures • Assignments • Individual projects/presentations • Case Study • Quiz Pre-readings: Wage and Salary structure in India, Role of Govt. bodies in deciding wage & salary, Types of wages and salary. Components of a compensation package.	completion of the course • The student will be expected to recognize how pay decisions help the organization achieve a competitive advantage. • They will be able to analyze, integrate, and apply the knowledge to solve compensation related problems in organizations. • They will also be able to demonstrate comprehension by constructing an effective compensation system.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Organizational Development and Change		Subject Code: BSA034D40H2	
L-T-P-C – 3-0-0-3		Credit Units: 3	
Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To introduce the fundamental concept of change and how the rate of change is accelerating • To make the students understand the role that effective change can play in improving the quality of work life and in improving organisational effectiveness • To provide familiarity with, and experience of, some of the main techniques of organisational change • To provide opportunity to develop awareness of their own personal style, attitudes and behaviours, relevant to the management of change	• Lectures • Assignments • Individual/Group projects/presentations • Case Study • Role plays • Quiz • Analysis of Relevant videos	• On completion of the course, the students will have sound knowledge of change and organisation development, models for organisation change, techniques for analysis of change issues within organisations, intervention strategies and skills, managing and evaluating effective change programs	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% 2. End Term Examination: 70%

Paper: HRD - Strategies and Systems	SubjectCode:BSA034D40H3
L-T-P-C-3-0-0-3	CreditUnits:3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• The objective of the course is to familiarize the students with the concepts, processes, practices and strategies that form the basis of successful HRD in organizations. • The course is designed to facilitate the development of knowledge and skills that HR specialists need in performing their strategic role.	• Lectures • Assignments • Individual/Group projects/ presentations • Case Study • Role plays • Quiz • Analysis of Relevant videos	• Understanding essentials of HRD and developing insight into principles of system design • Developing an understanding for designing career management and mentoring systems • Learning to design programs for work-life integration	• ContinuousEvaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid- term examination:10% • Attendance:5% • End Term Examination: 70%

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Paper: Branding & Integrated Marketing Communication		Subject Code: BSA03A0340M1	
L-T-P-C- 3-0-0-3		Credit Units: 3	
Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
• To impart understanding of the role brands play in contemporary businesses. • To provide an understanding of how brands are created and managed over time. • provides the learning about various communication tools and its effectiveness, in such a way that fosters the creative ideas from the learners for development of effective marketing communication programme	• Interactive Lectures • Case Study • Assignments • Individual/group presentation	• Developing understanding of the key issues in creating and managing brands • To develop a grasp of theoretical concepts and frameworks of branding • Understanding the marketing communication model, types of advertising • Strengthening the concepts related to main decision areas in advertising- mission, money, message, media and measurement	• Continuous Evaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-term examination:10% • Attendance:5% • End TermExaminat ion:70%

Paper: Services	Subject Code: BSA034D40M2
L-T-P-C – 3-0-0-	Credit Units: 3

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
• to acquaint the students with the unique challenges faced by service marketers • To augment skills and thinking to effectively marketing of services.	• Interactive Lectures • Case Study • Assignments • Individual/group presentation	• Appreciation of differences between goods and services marketing • Understanding the process by which value is created in service businesses • Learning and mapping of consumer response to service buying situations • Understanding quality concept, measurement and implementation processes in services	• Continuous Evaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-term examination:10% • Attendance:5% • End TermExamination:7 0%

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Paper: Salesmanship	Subject Code: BSA034D40M3
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• The objective of the Course is to develop an understanding of concepts, which are helpful in designing sound programs for organizing and managing the sales force.	• Interactive Lectures • Case Study • Assignments • Individual/group presentation	On completion of this course, the students will be expected • Understanding the role, importance and various aspects related to sales management, personal selling and salesmanship • Understanding the issues related to organizing, selecting and developing of sales force • Understanding the techniques of controlling and evaluating sales efforts	• Continuous Evaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-term examination:10% • Attendance:5% • End TermExamination:70%

Paper: Financial Derivatives & Risk Management	Subject Code: BSA034D40F2
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To introduce to the student the world of Financial Derivatives. • To make the student appreciate the risks and benefits in using Derivatives. • To equip the students with ways of using Financial Derivatives in Risk Management	• Interactive Lectures through Power point presentation • Case Discussions and Analysis • Learning through Massive open online courses • Assignments/projects at Individual/Group level	completion of the course students will become familiar with the world of Derivatives and new developments in this area. Moreover, a thorough understanding of conceptual framework of working of the instruments, their purposes and pricing will help in better Risk Management.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Corporate Taxation	Subject Code: BSA034D40F1
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To impart knowledge about different types of taxable & exempt incomes under current income tax laws and computational mechanism for total income liable to tax as well as to impart knowledge about payment of taxes & return filing procedures. • To impart knowledge about different types of taxable & non-taxable supplies under GST Laws as well as about the computational mechanism for taxable value of supply of goods and/ or services as well as to impart knowledge about set-off mechanism of Input Tax Credit &consequent payment of taxes thereof after understanding the rate schedules properly. • To acquire the ability to apply their understanding of GST to make tax computations and address application oriented issues as well as tax planning and management concerning GST.	• Interactive Lecture series with case based discussions on each topic. • Assignment • Group Discussions. • Individual/Group Presentation • Practice on practical problems with computational skills. • Self learning materials & providing relevant links for further study.	• On successful completion of this course, the students will be able to know about the basic concepts of tax laws prevalent in India as well as interpret the provisions of this tax law leading to their ability to properly analyze tax issues in a given case and solve such tax issues or real life problems. Further, students will generate sufficient skills among them to tax plan their affairs and do better tax management.	• Continuous Evaluation: 15%- (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-Term Examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Mergers and Corporate Restructuring	Subject Code: BSA034D40F3
L-T-P-C - 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• The objective of this course is to provide an understanding of accounting, regulatory and valuation aspects relating to corporate restructuring. • Understanding the linkages between corporate restructuring and financial markets and the impact of the same on share price and on the business. • Understand the concept and rationale for mergers and acquisitions. • Deal with accounting issues in a merger • Understand the valuation concepts in mergers • Analyse deal structuring in mergers.	• Interactive Lectures • Case Study • Practical problem solving. • Individual/group presentation • Self learning materials & important links for self learning & updated knowledge of the subject	After successfully completing this course, the participants will be able to understand the various methods available for corporate restructuring as a mode of consolidation. Also, students will gain conceptual knowledge about valuation of various tangible and intangible assets. Apart from this students will understand about the various legal and regulatory aspects associated with the corporate restructuring.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Entrepreneurial Finance & Venture Capital	Subject Code: BSA034D40E1
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To make the student learn the stages of entrepreneurial Venture and financing needs • To make the students know the various sources of finance and to measure financial performance of their ventures. • To enable the student to value their ventures and to effectively manage its finance aspect.	• Interactive Lectures • Case Studies • Group Discussions • Assignments/Projects	• On completion of the course, the students will be able to understand the various stages of a business venture and the need for financing at each stage. They will also be able to determine the financial position of their venture and to value their firm and to decide the sources of future funds. Finally, the students will be able to understand the various exit strategies from the firm.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination: 70%

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Paper: Social Entrepreneurship	Subject Code: BSA034D40E2
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To enable students to gain an integrated approach on Social Entrepreneurship. The aim of this composite approach is to provide students with firm foundation for understanding all main components of social entrepreneurship	• Lectures • Case Studies • Group Discussions • Assignments/Mini-projects Pre-readings: Entrepreneurship, Sustainable Development, Opportunity Identification, Environments affecting Entrepreneurship	• The student will have an insight to the basics of best practices and theories in regard to developing entrepreneurs in present day society.	• Continuous Evaluation: 15% • (Assignment, Class Test, Viva, Seminar, Quiz : Any Three) • Mid-term examination: 10% • Attendance: 5% • End Term Examination:70%

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Paper: Family Business Management	Subject Code: BSA034D40E3
L-T-P-C – 3-0-0-3	Credit Units: 3

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• This course would provide insights into the behaviour and dynamics of family business • This course focuses on the dynamics within family businesses and provides the tools to be successful as part of a family business, as a non-family employee within a family business, or as a consultant to, or board member of, a family business, planning, control and decision making. • This course will focus on the theory and actual practices of family businesses on topics that include the competitive strengths and weaknesses in a family firm; dynamics of family interactions and the family business culture; a conceptual Family Business Development model; communications and conflict resolution; strategic planning; and planning for succession.	• Interactive lecture with case-based discussions on situations. • Guest Lectures • Case Study • Assignments • Practical Problem solving • Individual/Group Presentation • Group Discussions.	• On completion of the course, the students will be able to explore the strategic, operating, financial, family, and career issues found in family owned and managed companies or privately-held firms • On completion of the course, it will help facilitate the students with the tools to be successful whether as part of a family business, as an employee with a family business, or as a consultant to a family business.	• ContinuousEvaluation:15% • (Assignment, Class Test, Viva, Seminar, Quiz: Any Three) • Mid-termexamination: 10% • Attendance:5% • End TermExamination :70%

Anuradha Das

Director, IQAC

The Assam Royal Global University

ROYAL GLOBAL UNIVERSITY
GUWAHATI

Royal School of Applied and Pure Sciences

Department of Physics

M.Sc. Physics

Learning Outcomes Based Curriculum Framework (LOCF)

2021

COURSE STRUCTURE & SYLLABUS

The Assam Royal Global University IQAC Estd : 2018

Anuradha Devi

Director, IQAC
The Assam Royal Global University

SYLLABUS (1st SEMESTER)

Paper I/Subject Name: Classical Mechanics **Subject Code: PHY014C101**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation	
1. To know about the Lagrangian formulation and its application, centralforce problem, Hamiltonian formulation, Euler's theorem etc.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Mechanics of a system of particles, constraints, d'Alembert's principle and Lagrangian equations 2. Kepler problem and planetary motion, scattering in central force field 3. Hamiltonian equation of motion, cyclic coordinates, phase space. Hamilton's principle 4. kinetic energy of a rotating body, tensor of inertia, Euler's angles, Euler's equations of motion	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)	

SYLLABUS (1st SEMESTER)

Paper II/Subject Name: Quantum Mechanics-I **Subject Code: PHY014C102**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To be familiar about inadequacies of Classical Physics, Black-body radiation, application of Schrodinger equation to one-dimensional problems, angular momentum operator in quantum mechanics, approximation methods in quantum mechanics	2. Lecture 3. Assignment 4. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Photoelectric effect, Compton effect, de Broglie hypothesis, Wave-particle duality of radiation and matter 2. Particle in a box; linear harmonic oscillator; square well potentials; potential step; barrier potential; tunneling effect 3. commutation relations of the three components; Commutation relation between position and angular momentum 4. Time dependent perturbation theory for a non-degenerate case and for a degenerate case, Stark effect	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

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SYLLABUS (1st SEMESTER)

Paper III/Subject Name: Mathematical Physics		Subject Code: PHY014C103
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To get knowledge about Vector algebra and vector calculus, Complex variables, Theory of second order linear homogeneous differential equations, Special functions	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. linear independence, basis expansion, Schmidt orthogonalization; matrices: Eigenvalues and eigenvectors; 2. Complex numbers, function of a complex variable : Cauchy-Riemann equations and their applications; analytic function 3. regular and irregular singular points; Frobenius method, linear independence of solutions: Wronskian, Sturm-Liouville's theory 4. Hermite and Laguerre functions., generating function Integral transforms Fourier and Laplace transforms	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (1st SEMESTER)

Paper IV/Subject Name: Physics Lab-I		Subject Code: PHY014C114
L-T-P-C: 0-0-4-4	Credit Units: 4	Scheme of Evaluation: P

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give the basics of physics and its application.	1. Demonstration 2. Experimentation 3. Correction	On completion of this course students will be able to gain interest on the following: 1. Stefan's constant – Black body radiation 2. Measurement of Planck's constant. 3. Determination of e/m by Thomson method.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Skill Test, lab copy, viva, lab involvement: Any Three: 25, Attendance: 05)

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SYLLABUS (1st SEMESTER)

Paper V/Subject Name: Nuclear & Particle Physics **Subject Code: PHY014D101**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To get knowledge about nuclear Properties: Size, shape and charge distribution, nuclear models, nuclear decay and radioactivity, elementary Particles	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Nuclear forces: Deuteron, Properties of the nuclear force, Spin dependence of nuclear force 2. The Semi empirical mass formula, mirror nuclei, Spin orbit coupling, liquid drop model 3. Fermi's theory of beta decay, allowed and forbidden transitions, selection rules 4. Types of Interactions, Conservation laws, CPT theorems, strangeness	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

SYLLABUS (1st SEMESTER)

Paper VI/Subject Name: Theory of Relativity **Subject Code: PHY014D102**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about Lorentz transformation equation, Space, Time and Gravity in Newtonian Physics, Covariant and contra variant vectors and tensors, quotient law, covariant differentiation	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students willbe able to gain interest on the following: 1. space time continuum, mass energy equivalence (E = Mc2), particles withzero rest mass 2. Space and time in relativity, four vector notation, velocity four vector, Newtonian Gravity 3. parallel displacement, geodesic equation alternative derivation from a Variational principle, curvature tensors 4. Newtonian theory from Einstein law, motion of a test particle in a weak gravitational field	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test,Seminar, viva, quiz (any three): 15, Mid- term exam:10, Attendance: 05)

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Condensed Matter Physics **Subject Code: PHY014C201**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about: Free electron theory of metals, Free electron model, Band theory of solids, Magnetic properties of solids, Superconductors	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Electrons moving in one dimensional potential well, three dimensional potential well, quantum state and degeneracy 2. Bloch function. Kronig-Penney model, number of states in a band, Energy gap 3. Fundamental concepts, quantum theory of diamagnetism and Para magnetism, diamagnetic and paramagnetic susceptibilities of free electrons 4. Critical temperature-persistent current-occurrence of super conductivity	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

SYLLABUS (2nd SEMESTER)

Paper IV/Subject Name: Physics Lab- **Subject Code:**

L-T-P-C: 0-0-4-4 **Credit Units: 4** **Scheme of Evaluation:**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give the basics of physics andits application.	2. Lecture 3. Assignment 4. Individual andGroup Presentation	On completion of this course students will beable to gain interest on the following: 1. Forbidden Energy Gap 2. Characteristics of LED and PIN PhotoDetector 3. Photo-diode and Solar-CellCharacteristics 4. Hall co-efficient, dielectric constant of solids.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks(Skill Test, lab copy, viva, lab involvement:Any Three: 25, Attendance: 05)

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SYLLABUS (2nd SEMESTER)

Paper II/Subject Name: Electrodynamics **Subject Code: PHY014C202**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about: Electrostatics: Magneto-statics: Electrodynamics: Maxwell's equations and their applications	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Differential and integral forms of Gauss's law, Cartesian coordinates, spherical coordinates 2. Biot-Savart law, divergence and curl of B, Gauge transformations, Scalar and vector potentials 3. Maxwell's equations, fixing of Ampere law by Maxwell, propagation of electromagnetic waves in vacuum 4. Macroscopic Maxwell equation, Relativistic electrodynamics	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

SYLLABUS (2nd SEMESTER)

Paper III/Subject Name: Quantum Mechanics -II **Subject Code: PHY014C203**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about: Time dependent phenomena: Heisenberg picture; Theory of scattering; Identical Particles: Consequences of indistinguishability of identical quantum particles; Relativistic Quantum Mechanics	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Time dependent phenomena, electric dipole approximation; Rayleigh scattering 2. Theory of scattering, Scattering by a Screened Coulomb potential. 3. Identical Particles, Particle number representation in quantum mechanics 4. Relativistic Quantum Mechanics, existence of spin of the Dirac particle.	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

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SYLLABUS (2nd SEMESTER)

Paper V/Subject Name: Optoelectronics and Non-linear optics **Subject Code: PHY014D201**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about: Optical sources: Direct and Indirect Band Gap materials, Light source Material Hetero junction structure; Photo Detectors: Principle of operation, Performance parameters, Introduction to Nonlinear response: graphical representation; Wave equations for non-linear medium	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Optical sources, Basic idea of Quantum dot, Quantum wire 2. Photo Detectors, Shot-Noise Signal to noise ratio, NEP (Noise Equivalent Power) 3. Nonlinear response, Models (illustration of non-linearity. 4. Wave equations for non-linear medium, Temporal Soliton, Self-Focusing	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

SYLLABUS (2nd SEMESTER)

Paper VI/Subject Name: Plasma and Space Physics **Subject Code: PHY014D202**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To know about: Plasma Physics; Elementary concepts; Plasma as fluids: Relation of plasma physics to ordinary electromagnetics; Space Physics; Introduction: early studies on geomagnetic field; Ionosphere: Ion production and loss, determination of ionospheric density	2. Lecture 3. Assignment 4. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Plasma Physics , Plasma confinement, adiabatic invariants 2. Plasma as fluids, MHD waves: magneto-sonic and Alfven waves 3. Space Physics, Sunspots, Solar Wind 4. Ionosphere, magnetic field configuration of the Earth's magnetosphere.	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance: 05)

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Atomic and Molecular Physics **Subject Code: PHY014C301**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To familiarize about the modern developments in experimental techniques especially spectroscopy and to realize the role and practical application of physics of atoms and molecules in the modern world	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Quantum states of Electron in atoms, Two electron systems, LS-JJ coupling Schemes 2. Hyperfine structure and isotopic shift, Zeeman and Paschen Back, Selection Rules , Stark effect 3. Classical and Quantum mechanical description, Nuclear interaction and Hyperfine Structure, 4. Born-Oppenheimer approximation, idea of symmetry for diatomic and polyatomic molecules.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (3rd SEMESTER)

Paper II/Subject Name: Statistical Mechanics **Subject Code: PHY014C302**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To make the learners understand how Thermodynamics deals with the relationship between heat and other form of energy & how Statistical Physics explains the behavior of ideal gas.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Scope and aim of statistical mechanics, The canonical ensemble and its thermodynamics, partition function 2. Ideal Bose System, Thermodynamic behaviour of an ideal Fermi Gas. 3. Phase Transitions: Phenomenology, Brownian motion 4. Strongly interacting systems: Ising model, Bragg-William's approximation.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (3rd SEMESTER)

Paper III/Subject Name: Physics Lab-III **Subject Code: PHY014C313**

L-T-P-C: 0-0-4-4 **Credit Units: 4** **Scheme of Evaluation: P**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give the basics of physics and its application .	1. Demonstration 2. Experimentation 3. Correction	On completion of this course students will be able to gain interest on the following: 1. characteristics of a GM tube, Holography 2. of harmonic generation, laser Raman spectra, BH curve 3. characteristics of JFET (Junction field effect transistor), 4. Trans conductance, using a CRO.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Skill Test, lab copy, viva, lab involvement: Any Three: 25, Attendance: 05)

SYLLABUS (3rd SEMESTER)

Paper IV/Subject Name: Non-Linear Optics and Laser Spectroscopy- I **Subject Code: PHY014D301**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To develop knowledge in the basics of nonlinearity in optical phenomenon and enhance comprehension in the knowledge of lasers spectroscopy 2. To understand higher order phenomenon's.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Nonlinear response, An harmonic Oscillator and free electron gas 2. Phase matching, sum frequency generation, 3. Rabi solution of Schrödinger equations, Quantum theory of non-linear susceptibility, 4. Self-focussing of light, Optical bistability and optical switching	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (3rd SEMESTER)

Paper V/Subject Name: Physics of Nanomaterials-I **Subject Code: PHY014D302**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To let the students have a fundamental understanding of physical properties and study on basic relationships between physical properties and phenomena and material dimensions in the nanometer scale.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Nanoscale and its significance, Challenges in nanotechnology. 2. Properties of nanoparticles, Semiconducting nanoparticles 3. Molecular beam epitaxy, Lithography 4. Special Nanomaterials, Fullerenes and Nanotubes	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (3rd SEMESTER)

Paper VI/Subject Name: Advanced Quantum Mechanics -I **Subject Code: PHY014D303**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To prepare students for higher studies which require knowledge of relativistic quantum mechanics.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Lorentz transformations and the Dirac equation, Four dimensional probability current density, 2. Foldy-Wouthuysen transformation and relativistic corrections, Lamb shift 3. Solutions to the Dirac equation, application of the Dirac equation to the Hydrogen atom, 4. properties of the Dirac equation, time reversal in classical physics and in quantum mechanics	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test,Seminar, viva, quiz (any three): 15, Mid- term exam:10, Attendance : 05)

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SYLLABUS (3rd SEMESTER)

Paper VII/Subject Name: Astrophysics-I | **Subject Code: PHY014D304**

L-T-P-C: 4-0-0-4 | **Credit Units: 4** | **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To make the study of astronomy and astrophysics interesting and fascinating for the students.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. The celestial sphere, Constructing the HR diagram of stars and star clusters 2. Telescopes and Instrumentations, Different types of astronomical telescopes and their mounts. 3. Radiation theory, Saha's ionization equation, 4. Integral theorems of hydrostatic equilibrium of stars, Supernovae.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05]

SYLLABUS (3rd SEMESTER)

Paper VIII/Subject Name: Physics of Semi-conductor-I | **Subject Code: PHY014D305**

L-T-P-C: 4-0-0-4 | **Credit Units: 4** | **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To familiarize the student with different structural & working phenomena and properties of semiconductor.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Band structure of semiconductors, general band structure. 2. Fermi distribution, high frequency transport, continuity equation. 3. Recombination in semiconductor, Hall kinetics. 4. Optical properties of semiconductor, phonon broadening	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (3rd SEMESTER)

Paper XI/Subject Name: Seminar/Literature survey | **Subject Code: PHY014D331**

L-T-P-C: 4-0-0-4 | **Credit Units:4** | **Scheme of Evaluation:**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To improve the presentation skill and subject knowledge of the students	1. One to one guidance and supervision 2. Individual and Group Presentation	On completion of this course, students are expected to acquire confidence to present their research work in the future.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Class test, viva, Mid-term exam:25, Attendance : 05)

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SYLLABUS (3rd SEMESTER)

Paper IX/Subject Name: Condensed Matter Physics-I **Subject Code: PHY014D306**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give foundation for further higher studies in Condensed matter physics	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Lattice dynamics, general theory of harmonic approximation 2. Thermal properties of solids , phonon-phonon collisions, 3. Band theory of solids, energy bands in a general periodic potential 4. Heisenberg Hamiltonian and model of ferromagnetism, The Bloch Wall.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (3rd SEMESTER)

Paper X/Subject Name: High Energy Physics-I **Subject Code: PHY014D307**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give a thorough understanding of the elementary particles	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Introduction to elementary particles, electron- positron scattering, Compton scattering. 2. conservation laws, Translation and rotation operators 3. baryon and lepton conservation 4. Introduction to symmetries, gluonium and quark-gluon plasma.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Laser and Raman Spectroscopy		Subject Code: PHY014C401
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To develop knowledge in the basics of lasers and enhance comprehension in the principles of lasers and to explore the control of laser properties and study Raman spectroscopy phenomenon's.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Interaction of radiation with matter, two and three level laser systems. 2. Solid state lasers, Gas lasers, Liquid and dye lasers 3. modes of resonators , mode locking 4. Raman spectroscopy, Rotational and vibrational Raman Spectra	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (4th SEMESTER)

Paper II/Subject Name: Semiconductor Devices		Subject Code: PHY014C402
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. The objective of the course is to familiarize the students with basic semiconductor devices and related theorems and to make the student understand the working and application of different digital devices.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Semiconductor devices, Homo and Heterojunction devices 2. De Morgan's laws, Multiplexer, Demultiplexer. 3. Operational amplifier, Oscillators 4. Amplitude and Frequency modulation, Microprocessors and Microcontrollers.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th SEMESTER)

Paper III/Subject Name: Non-Linear Optics and Laser Spectroscopy-II		Subject Code: PHY014D401
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To develop knowledge in the basics of nonlinearity in optical phenomenon and enhance comprehension in the knowledge of lasers spectroscopy. 2. To understand higher order phenomena.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Stimulated Brillouin Scattering, Raman Spectroscopy. SRS and CARS 2. Nonlinear absorption, Two photon Doppler free absorption spectroscopy 3. Rate equations and lasing criteria, single and multimode oscillation 5. Ultrashort pulse propagation, optical levitation, optical cooling and ion trapping	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (4th SEMESTER)

Paper IV/Subject Name: Physics of Nanomaterials-II		Subject Code: PHY014D402
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To make the students understand the basic concepts of nanomaterials and enable them to explore the field of nanomaterials	2. Lecture 3. Assignment 4. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Quantum Confinement, Introduction of Quantum wells 2. Characterization of Nanomaterials 3. Electron transport in semiconductors and nanostructures 4. Applications of nanomaterials	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th

Paper V/Subject Name: Advanced Quantum Mechanics -II		Subject Code: PHY014D403	
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T	
Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
1. To prepare a student for highly sophisticated studies in theoretical Physics	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Identical particles, many particle states, Ground state energy and elementary theory of the electron gas 2. Field Quantization , angular momentum and charge 3. Quantization of non-relativistic and relativistic fields, Klein-Gordon field 4. Quantization of the radiation filed, the free electromagnetic field and its quantization	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th SEMESTER)

Paper VI/Subject Name: Astrophysics-II **Subject Code: PHY014D404**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To apply physical and mathematical concepts to the study of astronomy and astrophysics.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Degenerate stars, white dwarf, black holes, and gamma ray bursts 2. The Milky way Galaxy, Quasi-stellar objects 3. Principle of Equivalence, Particle trajectories in Gravitational field 4. Hubble's law, Elementary ideas on structure formations, age of Universe	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (4th SEMESTER)

Paper VII/Subject Name: Physics of Semi-conductor-II **Subject Code: PHY014D405**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce the students with the operational principle and the analysis of different semiconductor devices.	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Special topics in semiconductor physics, Nano tube and their optical properties. 2. Bipolar semiconductor devices, Shockley diode 3. Unipolar semiconductor devices, MOSFET 4. Photonic semiconductor devices	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th SEMESTER)

Paper VIII/Subject Name: Condensed Matter Physics-II		Subject Code: PHY014D406
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To give foundation for research and higher studies in condensed matter physics	1. Lecture 2. Assignment 1. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 1. Dielectrics: theory and applications, plasmons, polaritons and polarons 2. Ferroelectric crystals, first order transitions; antiferroelectricity 3. Quantum theory of magnetic susceptibility & magnetic resonance 4. Superconductivity, Superconducting quantum interference device (SQUID)	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

SYLLABUS (4th SEMESTER)

Paper IX/Subject Name: High Energy Physics-II		Subject Code: PHY014D407
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To understand the standard model of physics and to be able to work in high energy physics phenomenology	1. Lecture 2. Assignment 3. Individual and Group Presentation	On completion of this course students will be able to gain interest on the following: 2. Fundamental interactions , weak decays of quarks. 3. Electroweak interaction, Strong: matter fields 4. Unification schemes, neutrino mass 5. Introduction to field theory, quantization of Dirac field and non-relativistic Schrodinger equation.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment, class test, Seminar, viva, quiz (any three): 15, Mid-term exam:10, Attendance : 05)

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SYLLABUS (4th SEMESTER)

Paper X/Subject Name: Project / Seminar		Subject Code: PHY014D431
L-T-P-C: 0-0-0-12	Credit Units: 12	Scheme of

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To improve the presentation skill and subject knowledge of the students	1. One to one guidance and supervision 2. Individual and Group Presentation	On completion of this course students will be expected to acquire confidence to present their research work in the future.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks Presenation:20, Viva:10

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ROYAL GLOBAL UNIVERSITY

GUWAHATI

ROYAL SCHOOL OF HUMANITIES & SOCIAL SCIENCES (RSHSS)

COURSE STRUCTURE

M.A. – Public Administration

The Assam Royal Global University IQAC Estd. 2018

Anuradha Devi

Director, IQAC
The Assam Royal Global University

Level: Semester I

Course: C-1

Title of the Paper: Administrative Theory

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
To help the students to analyze the behaviouralism, organizational humanism, market theories of administration and the latest trends with emphasison individual thinker. The course will also increase student's ability to comprehend the basic tenets and developments of administrative theory.	1. Lecture 2. Assignment 3. Individual and Group Presentation	The student will have an insight into the various schools of administrative thought and theories that shaped the emergence of modern bureaucracy.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester I, Course: C-2

Title of the Paper: Organizational Behavior

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
To impart a theoretical understanding of the nature of individual and group behavior within organizations, such that one possesses mastery of this knowledge,To increase one's ability to draw conclusions and develop inferences about attitudes and behavior, when confronted with different situations that are common in modern organizations	1. Lecture 2. Assignment 3. Individual and Group Presentation	To increase one's skills in identifying motives and in discriminating between different behavioral and attitudinal mechanisms thataffect members of organizations, to cultivate one's abilities and skills in critical thinking, written communications, verbal discussion and debate, teamwork, and decision making	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester I

Course: C-3

Title of the Paper: Financial Administration in India

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The course on Financial Administration in India will teach the students about the concept, nature and scope of the FinancialAdministration in India. The course will also provide insight on variousconcepts and institutions on Financial	1. Lecture 2. Assignment 3. Individual and GroupPresentation	After completion of this course the students will be able to understand the importance and relevance of financial Administration in Public Administration.The students will also learn about various concepts of Financial Administration	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation:05, Class Participation: 05, Attendance : 05)
Administration like budgeting, accounting and audit system.		in Indian context.	

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Level: Semester I

Course: C-4

Title of the Paper: Indian Administration

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
This paper attempts to familiarize the student of Public Administration with the basic philosophy and features of the Indian Constitution, particularly those serving as the basis of the administrative set up in India.	4. Lecture 5. Assignment 6. Individual and Group Presentation	The students will also be familiarized with the institutions that make up the system alongwith a conceptual and historical understanding	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester I

Course: DSE-1

Title of the Paper: Constitutional Law I

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To provide a thorough concept of the salient features, sources and the form of government in the country. 2. To highlight the nature of the Constitution with focus on the center-state relationship etc. in the federal structure. 3. To provide an idea on the role administrative bodies under the Constitution.	1. Lecture 2. Assignment 3. Individual and Group Presentation	1. Studying the Constitutional Law of India will enable the students to make their legal base strong 2. To know more and more about the legal and political foundation of the Country.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

Marks/ Credits: 100/4

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Level: Semester I

Course: DSE-2

Title of the Paper: Corporate Governance

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The Objectives of this paper is to acquaint the student with the concept and theories of corporate governance. The student will also be instructed about the various aspects ofcorporate governance with focus on ethics, corporate social responsibility and current issues and problems, primarily focusing on India.	4. Lecture 5. Assignment 6. Individual andGroup Presentation	Students will able to actas good share holders or investor, active participant in the governance.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, ClassParticipation: 05, Attendance : 05)

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Level: Semester II

Course: C-1

Title of the Paper: Industrial Relations and Labour Laws

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The course is designed to give inputs to the students on the relevant aspects of social legislation from different perspectives, which will go a long way in guiding them when they take over as managers. To familiarize the students with the understanding of industrial and labour related social security laws. To teach the student their application in the organization to maintain employee relations.	1. Lecture 2. Assignment 3. Individual and Group Presentation	This course will expose the students to a variety of IR situations with and other related matters and equip them with the necessary tools to apply the law to a given a set of facts. The students will be familiarized with the administration of labour laws in India at the Central and State levels Enhance their understanding on functioning of labour related departments that enforce various labour laws in India.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester II

Course: C-2

Title of the Paper: Public Economics

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The course is designed to give inputs to the students on the relevant aspects of social legislation from different perspectives, which will go a long way in guiding them when they take over as managers. To familiarize the students with the understanding of industrial and labour related social security laws.	4. Lecture 5. Assignment 6. Individual and Group Presentation	1. This course will expose the students to a variety of IR situations with and other related matters and equip them with the necessary tools to apply the law to a given a set of facts. 2. The students will be familiarized with the administration of labour laws in India at the Central and State levels 3. Enhance their understanding on functioning of labour related departments	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester II

Course: C-3

Title of the Paper: Comparative Public Administration

Marks/Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
1. This course will help the students to understand the connection between democracy and Public administration, 2. This course will help students to identify the political and administrative possibilities inherent in democracy and analyze the issues relating to the governance.	1. Lecture 2. Assignment 3. Individual and Group Presentation	1. This course will enable the students to understand the close relationship between public administration and Democracy. 2. Students will be familiar with various concepts like people's participation, accountability, and governance.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester II

Course: C-4

Title of the Paper: Research Methodology and Statistics

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
This paper aims to acquaint the student with the knowledge of rationale and methodology of conducting good quality research in social sciences with special reference to Public Administration. The major Objectives of this paper is to prepare students for undertaking quality research at Masters' levelaad a basis for pursuing research as a career.	7. Lecture 8. Assignment 9. Individual and Group Presentation	The course seeks to equip students in structuring research design, formulating research questions/hypotheses, tools to collect data and analyze it with the help of suitable statistical techniques.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester II

Course: DSE-1

Title of the Paper: Constitutional Law II

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To gain a detailed understanding of the salient features, sources and form of government in the country by studying the provisions of the Constitution of India. 2. To study the nature of the Constitution by focusing on the center-state relationship in the federal structure of the country. 3. To understand the role and functions of the administrative bodies under the Constitution	1. Lecture 2. Assignment 3.Individual and Group Presentation	A. Studying the Constitutional Law ofIndia will strengthen the legal base of students. B. It will deepen their understanding of thelegal and political foundation of the country.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Director IQAC
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Level: Semester II

Course: DSE-2

Title of the Paper: Project Management

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
The relevance of the course is and the objectives are to impart a deep understanding of all the stages of project management and the techniques supporting project management.	1. Lecture 2. Assignment 3. Individual and Group Presentation	Project Management continues to grow as a profession. Project management techniques are now used outside the traditional project industries and a management-by-project approach has increasingly been adopted in development projects funded by the UN, World Bank and other international agencies; it is also sought to be adopted in government funded welfare and development projects.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester III

Course: C-1

Title of the Paper: Organizational Development and Administrative Improvement

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
Organisational Development and Administrative improvement are important aspects of administrative management. The objectives of this paper are to comprehensively deal with the varied reference points leading to promoting administrative efficiency. The students will therefore gain an understanding of the ways in which change can be managed in an organisation at the operations and policy planning levels..	1. Lecture 2. Assignment 3.Individual and Group Presentation	A thorough study of the reports of the Government of India Commissions on Administrative Improvement and Reforms and the working of the O&M Division of the Government of India will link the theoretical and operational aspects of administrative improvement in public administration	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester III

Course: C-2

Title of the Paper: Public Personnel Administration & Human Resource Management.
Marks/Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The course will also provide insight on Human resource management, Employees, Capacity building, Strategies and assessing Human Resource management effectiveness.	1. Lecture 2. Assignment 3. Individual and Group Presentation	The students could also opt for specialization on Human Resource Management after learning the basic concepts.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

Level: Semester III

Course: C-3

Title of the Paper: Public Policy & Analysis

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. The course aims to give the students a detailed insight into Public Policy, Policy Formulation, Policy implementation and evaluation, Policy analysis. 2. The idea is to introduce the comprehensive framework of Public Policy to the students.	1. Lecture 2. Assignment 3.Individual and Group Presentation	1. The students will be able to understand Public Policy and its formulation and Public Policy in Indian context. 2. In addition, learning various approaches and types of Public Policy will create more curiosity among the students to opt for research in the future.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester III

Course: DSE 1

Title of the Paper: Rural local Administration

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
This course will provide an introduction to the theory and practice of rural development. It will use examples of topical issues from developed and developing nations to illustrate the range of challenges facing rural areas in different parts of the world. It will focus on the origins of key	1. Lecture 2. Assignment 3. Individual and Group Presentation	After completion of this course, the students in MA in Public Administration will be able to understand the Rural local administration in general and India in Particular and able to pursue research on the Rural local administration	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation:
issues and the factors influencing the ways in which solutions are identified and implemented will be analysed through a series of case studies.		And its issues and prospects.	05, Class Participation: 05, Attendance: 05)

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Level: Semester III

Course: DSE 2

Title of the Paper: Organisational Psychology

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
The paper will make the students familiar with the basic concepts of Organisational Psychology. Functional aspects of Organizational Psychology like human relations, employment, attitudes, groups, personality and work stress would be taught to the students.	1. Lecture 2. Assignment 3. Individual and Group Presentation	Students will be able to understand to manage work stress, traits of personality, significance of right attitude.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester III

Course: DSE 3

Title of the Paper: Ethics in Public Administration

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
The aim of the paper is to acquaint the students with the coacept and philosophy of ethics with special reference to ethics inpublic life and accountability of public services m India. The paper through teaching in case studies will enhance theproblem solving skills on situations relating to integrity, probity in public life and problem solving approach to various issues and conflicts face by him in dealing with society.	1. Lecture 2. Assignment 3. Individual and Group Presentation	1. The students will learn to effectively communicate ethics and governance concepts and arguments in a logical manner.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester III

Course: DSE 4

Title of the Paper: Administrative Thought

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
To make the student aware of theories and thoughts of various classical, neo-classical and modern thinkers in the area of administration and organization.	1. Lecture 2. Assignment 3. Individual and Group Presentation	It will equip the student with a deep understanding of the historical evolution of administrative thought, various conceptualizations and their application.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester III

Course: DSE 5

Title of the Paper: International Organizations

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
To enhance the ability to analyze the role of International Organizations, Non-State Actors, World Financial Institutions	1. Lecture 2. Assignment 3. Individual and Group Presentation	It will equip the student with a deep understanding of the role and relationships of International Financial Institutions Breton Woods System WTO	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester IV

Course: C 1

Title of the Paper: E-Governance and Administrative Reforms

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1.Delineating the constitutional provisions and dynamics of union - state relationships 2.Awareness about the institutions and mechanismin force for citizen-state interface	1. Lecture 2. Assignment 3. Individual and Group Presentation	1. Knowledge about the evolution and growth of Indian Administration 2. Familiarity with the constitutional framework on which Indian Administration is based. 3. Grasping the role of Union Executive 4.Understanding the in-built control mechanisms over constitutional bodies in particular and administration in general.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Course: C 2

Title of the Paper: Economic Administration and India Economy

Marks/Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
During the course of study the student will be familiarized with the economic models of the government, industrial policies and economic legislations. In addition, the students would be taught about the promotional role of State by referring to various promotional and infrastructural public sector undertakings	1. Lecture 2. Assignment 3. Individual and Group Presentation	Student will develop critical thinking about the market completion and acquire knowledge about the economic administration	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

Level: Semester IV
Course: DSE- 1
Title of the Paper: Urban Local Administration
Marks/Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
This course aims to give the students an idea about the Urban local administration as a whole and the various elements involved in understanding the nature and functioning of the Urban Local administration as general and particularly in India.	1. Lecture 2. Assignment 3. Individual and Group Presentation	After completion of this course, the students in MA in Public Administration will be able to understand the urban local administration in general and India in Particular and able to pursue research on the urban local administration	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation:
		And its issues and prospects.	05, Class Participation: 05, Attendance: 05)

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Level: Semester IV

Course: DSE- 2

Title of the Paper: Administrative Law

Marks/Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evolution
In this paper the concept of administrative law will be discussed in detail. It will highlight the use of delegated legislation, judicial review and Lokpal and Lokayuktas in India. It will also focus on the administrative difference among different countries which will give a comparative idea to the students.	1. Lecture 2. Assignment 3. Individual and Group Presentation	Administrative law will enable the students to learn the importance of studying *droit administrative* and hence they will get a clear picture of the modes by which the administration of India as well as the other democracies are run.	A. Semester end examination : 70 marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance: 05)

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Level: Semester IV

Course: DSE- 3

Title of the Paper: Social Policy and Welfare Administration

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The paper attempts to familiarize the students with various aspects of social welfare in India by emphasizing on policy, programmes and administration of the weaker sections, the administrative set up and the legislations in this area. The students will learn about various policies and programmes for welfare of women, children and other disadvantaged groups as well as the role of non-governmental organizations in social welfare and its administration.	1. Lecture 2. Assignment 3. Individual and Group Presentation	After completion of their course, the students will able to understand and solve social welfare needs and problems in the society.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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Level: Semester IV

Course: DSE- 4

Title of the Paper: Environment Administration

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. Knowledge pertaining to environment, energy and natural resources especially in scientific, economic, political and institutional perspectives 2. An understanding of the Indian environment policies and their implementation	1. Lecture 2. Assignment 3. Individual and Group Presentation	Students will able to understand environmental problems and ; Interstate and International Cooperation for Environment Protection	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

Course: DSE- 5

International Relations

Marks/ Credits: 100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
To enhance the ability to explain the nature of International Relations	1.Lecture 2. Assignment 3. Individual and Group Presentation	Students will able to understand Approaches in International Relations Post-positivist Approach	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05, Attendance : 05)

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ROYAL GLOBAL UNIVERSITY
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Royal School of Humanities and Social Science

RSHSS

Department of Economics

Learning Outcomes-based Curriculum Framework (LOCF) forUndergraduate Programme

MA in Economics

The Assam Royal Global University IQAC Estd : 2018

Anuradha Dev.

Director, IQAC
The Assam Royal Global University

SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Micro Economics-I		Subject Code:ECO184C101
L-T-P-C – 4-1-0-6	Credit Units: 4	Scheme of Evaluation: (T)

Course Objectives:

The purpose of a course in Microeconomics is to give students a thorough understanding of the principles of economics that apply to the decisions of individuals--both consumers and producers--within the larger economic system. It places primary emphasis on the nature and functions of product markets, and includes the study of factor markets and the role of government in promoting greater efficiency and equity in the economy.

- To make the students acquaint with the advanced microeconomic principles.
- To familiarize the students with Consumer Behaviour, Production Functions and Allocation of Scare Resources.
- To provide them a proper understanding of financial accounting.

Learning Outcomes:

Having successfully completed this module a student will be able to learn-

1. Students will know certain advanced concepts like- CES production function.
2. They will learn how to gauge consumer behaviour, convert desire into demand, createsupply and strike equilibrium between the two.
3. They will have a knowledge on economic use of scare resources, their optimal use in different market conditions, price and output determinations especially-oligopoly andduopoly markets.
4. Students will develop certain behavioural knowledge of utilizing scarce resources in their dayto day life.
5. They will also develop certain skills of utilizing scarce means.

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SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Macro Economics-I		Subject Code: ECO 184C102
L-T-P-C – 4-0-0-4	Credit Units: 6	Scheme of Evaluation: (T)

Course Objective:

1. To introduce students to the basics of domestic and national income and also to the sectoralcomposition of national income.
2. To inculcate the knowledge of full employment and multiplier.
3. To acquaint students with the consumption and investment functions and also variousconsumption hypothesis.
4. To enhance understanding of the technical terms of supply of money and its variouscomponents.
5. To acquaint students with the theories of demand for money.

Learning Outcomes:

1. Students would be able to understand the basics of domestic and national incomes.
2. Students would be able to determine national income by applying methods of measurement of national income.
3. Students would be able to correlate national income with welfare.
4. Students would be able to identify the factors affecting consumption.
5. Students would be able to develop the knowledge of components of money supply.
6. Students would be able to understand the importance of demand for money.

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SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Quantitative Methods for Economics-I		Subject Code:ECO184C103
L-T-P-C – 4-0-0-4	Credit Units: 6	Scheme of Evaluation: (T)

Course Objective

This course is designed to provide a good grounding and an in depth understanding of the theory and application of differential calculus, and other techniques widely used in Economics. Topics of study include functions, univariate optimization, elasticity, financial mathematics, multivariate optimization, unconstrained optimization, matrices, integration etc.

Learning outcome:

Students are expected to learn-

1. Basic concepts like Function, variables, basic algebra etc.
2. Basic rules of differentiation, matrices and integration
3. Problem solving of differentiation, matrices and integration
4. Solve problems involving variables that discretely and continuously grow over time, andcompute present discounted values, future compounded values, and rates of growth.

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SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Development Economics-Theory and Practice		Subject Code:ECO184C104
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

1. To introduce students to the index of economic development and also the various problems of developing countries, specially poverty and inequality.
2. To develop the knowledge of various theories and models of economic development.
3. To acquaint them with the important aspects of the process of economic planning.
4. To enhance understanding of the importance of trade in economic growth.

Learning Outcomes:

1. Students would be able to define and measure economic development by using some tools, like Per Capita Income, HDI, HPI, etc.
2. Students would be able to acquaint them with various models and theories of economic growth and development.
3. Students would be able to develop the knowledge of skills of planning.
4. Students would be able to realise the role of trade in the path of economic growth of a country.

SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Indian Economics- Pre-Independence Period		Subject Code:ECO184D101
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to enable students to have knowledge of the scenario of Indian economy during colonial rule.

Learning Outcomes:

On completion of this course students will be expected to learn

- background of Indian economy with in the colonial period
- change of agrarian structure
- growth and performance of Indian Railways as a major identity
- Nature of industrialization during British period

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SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Computer Application in Economics		Subject Code:ECO184D102
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to introduce students to basics of computer applications relevant of economic analysis.

Course Outcomes:
On completion of this course students will be expected to understand economic analysis with the help of computer application. Students will get an exposure to diagrammatic representation, Statistical data analysis and methods like SPSS and STATA.

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Micro Economics-II		Subject Code:ECO184C201
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objectives:

The purpose of a course in Microeconomics is to give students a thorough understanding of the principles of economics that apply to the decisions of individuals--both consumers and producers--within the larger economic system. It places primary emphasis on the nature and functions of product markets, and includes the study of factor markets and the role of government in promoting greater efficiency and equity in the economy.

Learning Outcomes:

Having successfully completed this module a student will be able to learn-

- Students will know certain advanced concepts like Present value, evaluation of investment projects
- They will learn how to gauge General and partial equilibrium strike equilibrium between the two.
- They will have a knowledge on economic use of scare resources, their optimal use indifferent market conditions, Insurance Economics etc
- Students will develop certain behavioural knowledge of utilizing scarce resources intheir day to day life.

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Macro Economics-II		Subject Code:ECO184C202
L-T-P-C – 4—0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

1. To introduce students to the goods and money markets equilibrium, IS-LM model and its extension.
2. To enhance understanding of the technical terms of inflation and unemployment trade off.
3. To acquaint them with the balance of payments disequilibrium and uses of fiscal and monetary policies ascorrective measures to the BOP disequilibria.
4. To inculcate the knowledge of advance theories of business cycle.

Learning Outcomes

1. Students would be able to understand the goods market and money equilibrium and relative effectiveness of monetary and fiscal policies with respect to IS-LM model.
2. Students would be able to acquaint them with the important aspects of inflation and unemployment and alsothe Phillips curve.
3. Students would be able to identify the applications of both monetary and fiscal policies to remove internal and external disequilibria.
4. Students would be able to elaborate the real business cycle theory and Manu cost model.
5. Students would be able to enhance understanding of recession as coordination failure.

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Quantitative Methods for Economics-II		Subject Code:ECO184C203
L-T-P-C 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to know application of mathematics in economic theory especially imparting knowledge of Constraint optimization, dynamic analysis, simplex method and game theory.

Learning Outcomes:

On completion of this course students will be expected to learn

- About constraint optimization techniques
- Game theory-concepts and its application in economics
- Calculus for dynamic economics analysis
- Simplex method

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Statistical Method and Elementary Econometrics		Subject Code:ECO184C204
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

Econometrics is the use of statistical techniques to understand economic issues and test theories. Without evidence, economic theories are abstract and might have no bearing on reality. Econometrics is a set of tools we can use to confront theory with real-world data. It provides the tools to enable the students to extract useful information about important economic policy issues from available data.

This paper is a combination of probability theory and elementary econometrics

Learning Outcomes:

1. Students would be able to understand the basic concepts of econometrics.
2. Students would be able to practically use econometric tools in problem solving.
3. Students will also learn the correlation between mathematical concepts and econometrictheory.
4. Students are expected to learn about theory of probability and its distribution and its importance in the field of research and deriving conclusions.

SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Financial System		Subject Code:ECO184D201
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to introduce students the Indian Financial system- its constituents,Financial market-its types and functions, financial institutions and their services.

Learning Outcomes:

1. A proper knowledge on financial system of India is a milestone for our students to build up theircareer in various departments of financial system.
2. It will develop their problem solving capacity of various finance related queries.
3. Students can get the knowledge of digital methods of banking system

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Human Resource Development		Subject Code:ECO184D202
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to understand issues relating to human resource development.

Learning outcome:

- Students will learn about human resource management
- Will understand Planning of man-power
- Will understand about methods of selection procedure of employees, absenteeism, rewards and incentives.

Paper I/Subject Name: **Indian Economy: Post Independence Evolution and Present Perspective** Subject Code:ECO184C301		
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to

- Introduce students to major trend in economic indicators in India.
- Introduce Policy Measures
- Challenges of the economy.

Course Outcomes:

On completion of this course students will be expected to understand about

- Purchasing power parity, multi-dimensional poverty etc
- Development strategies during post independent India
- Role of public and private sector in India and trickledown effect
- IT sector and revolution in telecommunication sector
- Global economic environment

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Public Finance		Subject Code:ECO184C302
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objectives:

The objective of the course is to introduce students to about government finance with special reference toIndia. It looks into different components of government finance- like public revenue and public expenditure. This is designed as an extension of **Public Finance-I** structured in semester-III. It aims at imparting knowledge of theories of taxation, govt budgeting, centre-state financial relations etc.

Learning Outcome:

1. Students will understand the mechanism of the Government finance.
2. Will develop basic knowledge of taxation policies and their role in economic analysis.
3. Will be able to understand govt. policies easily with the help of basic knowledge of publicfinance.
4. Will also develop understanding of fiscal policies and their importance in developing countries.

SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Demography		Subject Code:ECO184D301
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

1. To introduce students to the theories of population.
2. To enhance understanding of the technical terms of vital rates and life table.
3. To inculcate the knowledge of basic measures of nuptiality.
4. To acquaint them with important aspects of migration and economically active population.
5. To develop the knowledge of population policy.

Learning Outcomes:

1. Students would be able to acquaint them with various theories of population.
2. Students would be able to understand the measures of reproductivity.
3. Students would be able to develop the knowledge of migration and various factors affecting different forms migration.
4. Students would be able to estimate population for a future period of time.
5. Students would be able to inculcate knowledge of population policies for controlling population growth.

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Welfare Economics		Subject Code:ECO184D302
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to theories and principles relating to welfare economics.

Learning Outcomes:

On completion of this course students will be expected to learn about

- Origin of welfare economics
- Peroto optimality and its role economic analysis
- Modern Theories given by Kaldor, Hicks and Scitovosky
- Externalities, Social cost and its calculation

SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Econometric Method		Subject Code:ECO184D303
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

Econometrics is the use of statistical techniques to understand economic issues and test theories. Without evidence, economic theories are abstract and might have no bearing on reality. Econometrics is a set of tools we can use to confront theory with real-world data. It provides the tools to enable the students to extract useful information about important economic policy issues from available data.

Learning Outcomes:

1. Students would be able to understand the advanced Econometric theories.
2. Students would be able to practically use econometric tools in decision making.
3. Students will also learn the correlation between mathematical concepts and econometrictheory.

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Economics for Insurance		Subject Code:ECO184D304
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to the principle of insurance and its economic analysis.

Learning Outcomes:

On completion of this course students will be expected to learn about-

- Application of economics in risk management in insurance
- Relationship between Insurance and economic development
- Essentials of health and life insurance

Paper I/Subject Name: Economics and laws		Subject Code:ECO184D305
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to relate economics and laws, Basics of legal institutions, consumers protections etc.

Learning Outcomes:

On completion of this course students will be expected to learn about-

- Laws relating to economic decision-making.
- Structure of legal institutions
- How to apply consumer's right
- Laws relating to business organization.

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Project :		
Paper I/Subject Name: Minor Project		Subject Code: ECO184C323
L-T-P-C - 0-0-4-4	Credit Units: 4	Scheme of Evaluation: (P)

Students will be guided to do research on a selected topic.

Course Objectives

Students must have practical knowledge of research. To develop interest on research activities they areasked to submit a minor report on select topics.

Learning Outcomes:

1. Students will learn the processes of data collection, classification, analysis and interpretation.
2. They will develop an interest in research work.
3. They will have practical knowledge

SYLLABUS (4th SEMESTER)

Paper I/Subject Name: International Economics		Subject Code:ECO184C401
L-T-P-C - 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

1. To introduce students to the theories of international trade.
2. To acquaint them with important aspects of terms of trade.
3. To enhance understanding of the technical terms of balance of payments and foreign exchange rates.
4. To develop the knowledge of international capital movements.

Course Outcomes:

1. Students would be able to discuss various theories of international trade.
2. Students would be able to understand the technical aspects of balance of payments and foreign exchange rates.
3. Students would be able to determine market equilibrium exchange rate and highlight the functions of foreignexchange market.
4. Students would be able to acquaint them with the role of international financial institutions like International Monetary Fund, World Bank, World Trade Organisation, etc.

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Environmental Economics		Subject Code: EC0184C402
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course objectives:

Environmental economics is a subset of economics concerned with the efficient utilization of resources. Because the environment provides both direct value and the raw material intended for economic activity, the environment and the economy are interdependent. For that reason, the way the economy is managed can have an impact on the environment that, in turn, may affect both welfare and the performance of the economy. The objective of the course is to introduce students to concepts, methods and policy options in managing the environment using tools of economic analysis.

Learning Outcomes:

On completion of this course students will be expected to learn about-

- The relationship between economics and issues of the environment.
- It also enables the students to learn about the concept of sustainable development, its issuesand policy measures relating to it.

Paper I/Subject Name: Agriculture and Resource Economics		Subject Code: EC0184D401
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to understand economics of farming sector with special reference to India.

Learning Outcomes:

On completion of this course students will be expected to learn

- About the relationship between economics and issues of the agriculture and farming sector.
- It also enables the students to study demand and supply components of agricultural sector and issues relating to pricing.

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Labour Economics	Subject Code:ECO184D402
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Course Objective:

The objective of the course is to introduce students to understand theories issues relating to labour.

Learning Outcomes:

1. Students can value the importance of labour in developing country like India. They can compare the rapidemergence of labour intensive industries of India with others.
2. They can also analyze labour''s migration behaviour and how communication skills of labourer may createhindrances in their survivals.
3. Students can correlate moral, ethical, cultura l and social-political thinking and views with others agents oftheeconomy.

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Industrial Economics		Subject Code:ECO184D403
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objective of the course is to introduce students to theories of firms and industries.

Course Outcomes:

On completion of this course students will be expected to:

- Learn about theories of firm
- Learn about issues of investment
- Learn about how technical change and market structure can influence industrialization.

SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Operation Research		Subject Code:ECO184D404
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to understand research methodology and also to conduct a research.

Course Outcomes:

On completion of this course students will be expected to:

- Learn to conduct a research
- Learn about the techniques of survey.
- Learn about estimation and project management

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Financial Operation and Management		Subject Code:ECO184D405
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to understand principles of measuring risk and return

Learning Outcomes:

On completion of this course students will be expected to:

- Learn market valuation of bond and equity stock
- Learn about risk management.
- Learn about derivative markets.
- Learn about theories relating to banking performance, market and interest risks of banks and also about bank failure.

SYLLABUS (4th SEMESTER)

Paper I/Subject Name: History of Modern economics		Subject Code:ECO184D406
L-T-P-C – 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)

Course Objective:

The objectives of the course is to introduce students to development and evolution of economic theories in the world.

Learning Outcomes:

On completion of this course students will be expected to learn about contributions of different schools in the process of developing economic theories and principles.

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ROYAL SCHOOL OF COMMUNICATIONS AND MEDIA

(RSCOM)

DEPARTMENT OF MASS COMMUNICATION

Learning Outcomes-based Curriculum Framework (LOCF) for

Postgraduate Programme

MA in Journalism and Mass Communication

W.E.F. 2022-2023

The Assam Royal Global University IQAC Date: 2018

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SYLLABUS (1st SEMESTER)
Paper: Introduction to Mass Communication **Subject Code:**JMC094C101 **L-T-P-C:**4-0-0-4 **Credit Units:** 4

Course Objectives:

The module will introduce the students to various types of communication and clarify the foundation of mass communication and its types besides the understandings of emerging trends in media.

Course Outcomes

1. Students will be able to explain the basic terms use in journalism and mass communication.
2. Toassess the applications of communication theories in mass media.
3. To analyze the types of communication and able to evaluate the effects of mass media on the society.
4. Students will finally be able to determine the underlying modus-operandi that dominates the media industry.

Paper: Journalism: Reporting and Editing
Subject Code:JMC094C102
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives:

The course introducesto define process of news gatherings and the role that journalism plays in the society. This will clarify the application of journalistic ethics and news values in mass communication, thereby, lay the foundation to professional journalist, equipped with practicalrequirements.

Course Outcomes

1. To explain the process of news gatherings and determine the role that journalism plays in the society
2. To analyze the application of journalistic ethics and news values in mass communication.
3. To evaluate credibility of news content and its presentation.
4. To determine the practical ability of professional media practitioner in mainstream media.

Paper: Communication Theories
Subject Code:JMC094C103
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course focuses to describe the basic theoretical and conceptual aspects of mass media, society, economy, culture and its relationship to individuals and the masses. It offersto clarify selected survey of critical humanistic and social scientific theories and its applications in media studies.

Course Outcomes

1. To analyze the basic theoretical and conceptual aspects of mass media, society, economy, culture

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and its relationship to individuals and the masses.
2. To explain selected survey of critical humanistic and social scientific theories and its applications in media studies.
3. To evaluate the theories and models in different forms of communication.
4. To determine the values of theories in media studies.

Paper: Photography
Subject Code:JMC094C114
L-T-P-C:0-0-8-4
Credit Units:4

Course Objectives

The course deals to provide knowledge of visual media technologies and clarify to capture great photographs and edit to tell a story. This will help to categorize the functions of photography, lighting techniques, indoor and outdoor shooting as well as to tell story by combining different visual elements in a frame.

Course Outcomes

1. To explain knowledge of visual media technologies.
2. To determine to capture great photographs and edit to tell a story.
3. To analyze the functions of photography, lighting techniques, indoor and outdoor shooting.
4. To evaluate a story by combining different visual elements in a frame

Paper:(Group-1) Writing for Media
Subject Code:JMC094D101
L-T-P-C:4-0-0-4
Credit Units:4

Course Objectives

The course focuses to describe professional writing skills and knowledge of the mass communication. It will help to outline the principles and processes of writing for print, radio & TVand different aspects of writing in media for various formats.

Course Outcomes

1. To explain professional writing skills and knowledge of the mass communication.
2. To justify different aspects of writing in media for various formats.
3. To evaluate the principles and processes of writing for print, radio and TV.
4. To determine different aspects of the art of writing for media in various formats

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Paper:(Group-2) Visual Communication
Subject Code:JMC094D102
L-T-P-C: 4-0-0-4
Credit Units: 4

Course Objectives

The module introducesto define the knowledge of visual thinking and understanding of semiotics languages as well as visual concept and its meaning in different elements of video, print and new media context. It clarifies hands-on training in different aspects of visual elements in mediated contents.

Course Outcomes

1. To explain the knowledge of visual thinking and understanding of semiotics languages
2. To determine visual concept and its meaning in different elements of video, print and new media context.
3. To justify hands-on training in different aspects of visual elements in mediated contents.
4. To evaluate the basic concepts of images and elements of compositions.

SYLLABUS
(2nd SEMESTER)

Paper: Media in North East **Subject Code:**JMC094C201
L-T-P-C:3-1-0-4 **Credit Units:** 4

Course Objectives

The course deals to describe the historical background of media and its evolution in North Eastern Region of India and clarify the trends in reporting and analysis of modern journalistic during conflict situations as well as to classify traditional media and the understanding of socio-economic, political and cultural Development of North Eastern Region in India.

Course Outcomes

1. Students would be able to explain the historical background of media and its evolution in North Eastern Region of India.
2. To justify the trends in reporting and analysis of modern journalistic during conflict situations
3. To determine the effects of traditional media in socio-economic, political and cultural Development of North Eastern Region in India.
4. To evaluate the problem and challenges faced by the journalists working in Northeast India.

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Paper: Development Communication	**Subject Code:**JMC094C202
L-T-P-C: 3-1-0-4	**Credit Units:** 4

Course Objectives

The module of the course is to describe the role of information, communication and the media in development and social change besides,clarifying the development theories and how these have influenced the different development communication approaches at various times.

Course Outcomes

1. After the successful completion of the course students would be able to explain the role of information, communication and the media in development.
2. Tojustify the elements of media in bringing a social change.
3. To determine the development theories and its influencesin various development communication approaches.
4. To evaluate the implications of sustainable development in development communication.

Paper: Media and Cultural Communication	**Subject Code:**JMC094C203
L-T-P-C:4-0-0-4	**Credit Units:** 4

Course Objectives

The course focuses to describe the historical overview of cultural studies and its emphasis on media and popular culture besides, familiarizing the foundational texts and formative debates to define cultural studies and its approaches, ideology, semiotics, race, ethnicity, gender and resistance. It will help to justify the implication of interdisciplinary critical perspectives to examine the diverse meanings of cultural objects andits processes as well as to clarify culture through oral and written modes of communication.

Course Outcomes

1. To explain the historical overview of cultural studies and its emphasis on media and popular culture.
2. To categorize the foundational texts and formative debates to explain cultural studies and its approaches, ideology, semiotics, race, ethnicity, gender, resistance and others.
3. To analyze the implications of interdisciplinary critical perspectives to examine the diverse meanings of cultural objects and its processes.
4. To evaluate culture through oral and written modes of communication

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Paper: Media Planning and Management	**Subject Code:** JMC094C204
L-T-P-C: 3-1-0-4	**Credit Units:** 4

Course Objectives

The course deals to describe the principles, theories and functions of media industryand its managementin print, electronic, new media, advertising, cinema, public relations and community mediaas well as the process of starting media business in India and the role played by media planners, challenges in planning, criteria for selection of media and media mix approach management.

Course Outcomes

1. To explain the principles, theories and functions of media industry
2. To justify media management in print, electronic, new media, advertising, cinema, public relations and community media.
3. To analyze the process of starting media business in India.
4. To evaluate the role played by media planners, challenges in planning, criteria for selection of media and media mix approach management.

Discipline Specific Elective (DSE-2)

Paper: (Group-1) Computer Application (Design and Editing)
Subject Code: JMC094D211
L-T-P-C: 0-0-8-4
Credit Units: 4

Course Objectives

The course focuses to describe the features that distinguishes the different types of graphics applications and design processes and to clarify digital media and freehand drawing skills to support design communication and thinking processes as well as to classify technical skills for digital and traditional types of composition.

Course Outcomes

1. To explain the features that distinguishes the different types of graphics applications and design processes
2. To assess digital media and freehand drawing skills to support design communication and thinking processes.
3. To analyze the technical skills for digital and traditional types of composition.
4. To evaluate the types of video editing, special effects and after effects.

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Paper: (Group-2) Photojournalism
Subject Code:JMC094D211
L-T-P-C: 0-0-8-4
Credit Units: 4

Course Objectives

The course deals to describe the fundamentals of photojournalism and visual communications as well as the basic instruction, demonstration and samples of the desired outcomes. It focuses to create a blog/website and the applications of audio-visual elements besides, outline to select a theme or subject on news production.

Course Outcomes

1. To explain the fundamentals of photojournalism and visual communications.
2. To analyze the basic instruction, demonstration and samples of the desired outcomes inphotojournalism.
3. To evaluate a blog/website and the applications of audio-visual elements.
4. To determine a theme or subject on news production.

SYLLABUS
3rd SEMESTER

Paper: Media Research
Subject Code:JMC094C301
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course focuses to describe media research culture among academics and professionals in different fields and to clarify research in their specific academic fields on philosophical, epistemological understanding of the elements of research as well as to classify various types of research designs and its procedures to conduct research to meet the national and international requirements.

Course Outcomes

1. To explain media research culture among academics and professionals in different fields.
2. To justify research in their specific academic fields on philosophical, epistemological understanding of the elements of research.
3. To determine various types of research designs.
4. To evaluate research to meet the national and international standards independently.

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Paper: Film Studies
Subject Code:JMC094C302
L-T-P-C:3-1-0-4
Credit Units:4

Course Objectives

The course introduces to define the major industrial, technological, aesthetics and cultural developments in the history of motion pictures, and the invention of motion pictures, film industry and audience, narratives of film, developments of cinematic techniques and film as art. It also focuses to clarify the changing paradigms of cinematic realism and its technological innovation as well as to understand the nature and process of film production and the applications of theoretical perspectives in films.

Course Outcomes

1. To explain the major industrial, technological, aesthetics and cultural developments in the history of motion pictures
2. To classify the invention of motion pictures, film industry and audience, film genres and narratives of film, developments of cinematic techniques and film as art.
3. To justify the changing paradigms of cinematic realism and its technological innovation.
4. To analyze the nature and process of film production and able to evaluate the applications of theoretical perspectives in films.

Paper: Video Editing
Subject Code:JMC094C313
L-T-P-C: 0-0-8-4
Credit Units: 4

Course Objectives

The course introduces to define the art of video post-product and implications of theory and practice of editing styles to narrate stories in the editing room as well as to clarify hands-on experience in advanced editing techniques with in-depth examination of Final Cut Pro and Adobe Premier in order to justify how video content produced and ideate and plan a film and edit accordingly with the requirements in editing films.

Course Outcomes

1. Students would be able to explain the art of video post-product and implications of theory and practice of editing styles to narrate stories in the editing room.
2. To justify hands-on experience in advanced editing techniques with in-depth examination of Final Cut Pro and Adobe Premier.
3. To analyze how video content produced.
4. To evaluate and plan a film and edit accordingly with the requirements in editing films.

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Paper: (Group-1) Online Journalism
Subject Code:JMC094D301
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course is design to describe Internet and World Wide Web from the perspective of online journalism in order to adapt with multimedia tools like digital audio recorders, video recorders, cameras and GSM phones to tell stories and its effects in society. It deals to clarify the techniques of journalism in digital media and its conceptual tools,the basics of online publishing and writing by categorizing reporting and publishing offline and online techniques.

Course Outcomes

1. Students would be able to explain Internet and World Wide Web from the perspective of online journalism.
2. To justify multimedia tools like digital audio recorders, video recorders, cameras and GSM phones to tell stories and its effects in society.
3. To analyze the techniques of journalism in digital media and its conceptual tools, the basics of online publishing and writing.
4. To evaluate reporting and publishing offline and online techniques.

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Paper: (Group-2) Global Communication
Subject Code:JMC094D301
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course is design to classify different forms of global media and its effect on the news flow and the implications of theoretical approach to social network sites, social interaction, and mobile phones activism in multimedia and digital media, technology uses for interaction in global communicationand its impact on culture. It deals to clarify satellite, mobile technologies, live streaming and podcasting technologies.

Course Outcomes

1. After successful completion of the course students would be able to explain the different forms of global media and its effect on the global news flow.
2. To determine the implications of theoretical approach to social network sites, social interaction, and mobile phones activism in multimedia and digital media.
3. To analyze the new media tools and technology uses for interaction in global communication and its impact on culture.
4. To evaluate satellite, mobile technologies, live streaming and podcasting technologies.

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Paper: (Group-1) Basics to Advertising
Subject Code:JMC094D302
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course focuses to describe different areas of advertisement and its principles and practices as well as to clarify the mysteries of marketing agency structures. It will learn to classify the different types of advertisements and to produce advertisement for radio, television and print media, besides various elements and components in advertising.

Course Outcomes

1. To explain different areas of advertisement and its principles and practices.
2. To justify the mysteries of marketing agency structures.
3. To determine the different types of advertisements and to produce advertisement for radio, television and print media.
4. To evaluate various elements and components in advertising.

Paper: (Group-2) Radio and Television Production
Subject Code:JMC094D302
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course introduces to define the overview of the principles and practices of broadcasting and audio-visual production techniques in order to clarify the writing skills for radio and television journalism and its production. The course deals to describe the history, origin and growth of electronic media.

Course Outcomes

1. To explain the overview of the principles and practices of broadcasting,and audio-visual production techniques
2. To justify the writing skills for radio and television journalism and its production.
3. To determine the history, origin and growth of electronic media.
4. To evaluate the techniques in production, interviewing, voice-over, anchoring and presentation of news.

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Paper: (Group-1) Layout and Design
Subject Code:JMC094D313
L-T-P-C:0-0-8-4
Credit Units: 4

Course Objectives

The course focuses to describe digital technology and software used in graphic designing and layout in order to clarify the importance of graphics in communication process. It deals to classify effective layout and designs for newspapers and magazines.

Course Outcomes

1. To explain digital technology and software used in graphic designing and layout.
2. To determine the importance of graphics in communication process.
3. To evaluate effective layout and designs for newspapers and magazines.
4. To assess different types of printing and publishing technology by using different kinds of papers, printing color schemes and modes in print media.

Paper: (Group-2) Digital Media and Graphics

Subject Code:JMC094D313
L-T-P-C:0-0-8-4
Credit Units: 4

Course Objectives

The course introduces to define digital technology and software used in graphic designing and animation as well as to clarify the importance of graphics in communication process. It deals to adapt with effective layout and designs for audio video newspapers and magazines by employing web designing concept and 2-Dimensional Design in film industry and digital media.

Course Outcomes

1. To explain digital technology and software used in graphic designing and animation.
2. To determine the importance of graphics in communication process.
3. To categorize effective layout and designs for audio video newspapers and magazines
4. To evaluate web designing concept and 2-Dimensional Design in film industry and digital media

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SYLLABUS
(4th SEMESTER)

Paper: Media Laws and Ethics
Subject Code:JMC094C401
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course introduces to define the basic understanding of media and legal system, and the principles and concepts of ethics in moral reasoning to solve ethical issues in media. It focuses to clarify the impact of internet in journalism and regulations of new communication technology and the legal frameworks of the rights and responsibilities of journalists as well as to analyze the important legal and ethical issues involved in mass media industry.

Course Outcomes

1. To explain the basic understanding of media and the legal systems.
2. To categorize the principles and concepts of ethics in moral reasoning to solve ethical issues in media.
3. To determine the impact of internet in journalism and regulations of new communication technology and the legal frameworks of the rights and responsibilities of journalists.
4. To evaluate the important legal and ethical issues involved in mass media industry.

Paper: Current Affairs
Subject Code:JMC094C402
L-T-P-C: 3-1-0-4
Credit Units: 4

Course Objectives

The course focuses to adapt with the current news, compose news items and aware of national and global scenario. The module serves as a refresher course, which will comprehensively cover the contemporary newsmakers and events and to analyze the debate on contemporary issues with specific case studies of regional, national and international importance.

Course Outcomes

1. To explain current news, compose news items and aware of national and global scenario.
2. To determine the contemporary newsmakers and events.
3. To evaluate the debate on contemporary issues with specific case studies of regional, national and international importance.
4. To maintain a well informedmedia practitioner in this information society..

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Discipline Specific Elective-6 (DSE-6)

Paper: (Group-1) Corporate Communication

Subject Code:JMC094D401
L-T-P-C: 4-0-0-4
Credit Units:4

Course Objectives

The course introducesto describe the concepts of corporate communication and reputation building management with case studies and crises management. It focuses to categorize the community relations, customer, vendor and dealer relations by employing various communication tools for crisis management as well as to justify the legal and ethical issues in the Corporate Communication.

Course Outcomes

1. To explain the concepts of corporate communication and reputation building management with case studies and crises management.
2. To determine the community relations, customer, vendor and dealer relations by employing various communication tools for crisis management.
3. To evaluate the legal and ethical issues in the Corporate Communication.
4. To assess the various applications of Corporate Communication.

Paper: (Group-2) Science, Environment & Health Communication
Subject Code:JMC094D401
L-T-P-C: 4-0-0-4
Credit Units: 4

Course Objectives

The course introduces to define the techniques for specialized reporting of science, environment and health-related issues and reporting. It deals to adapt with the functions of global agents and clarify the effective uses of media to fight against the climate change and pandemic.

Course Outcomes

1. To explain the techniques for specialized reporting of science, environment and health-related issues and reporting.
2. To determine the functions of global agents to fight against the climate change and health related issues domestically and internationally.
3. To assess the effective uses of media to fight against the climate change and pandemic like Covid-19.
4. To evaluate research on media coverage of environmental and health issues in Indian media.

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Discipline Specific Elective-7 (DSE-7)

Paper: (Group-1) Conflict communication
Subject Code:JMC094D402
L-T-P-C: 4-0-0-4
Credit Units: 4

Course Objectives

The course introduces to describe the dynamics of conflicts and succinct analysis of current conflicts in any given society as well as to clarify conflicts in north-east India from the perspectives of media. It will help to justify values of news in conflict driven communities and societies from the lenses of investigative reporting and peace journalism in order to define the power of media and its ethical issues.

Course Outcomes

1. To explain the dynamics of conflicts and succinct analysis of current conflicts in any given society.
2. To determine conflicts in north-east India from the perspectives of media.
3. To assess the applications of news values in conflict driven communities and societies
4. To evaluate the power of media and its ethical issues in dealing conflict communication.

Paper: (Group-2) International Communication
Subject Code:JMC094D402
L-T-P-C: 4-0-0-4
Credit Units: 4

Course Objectives

The course providesto define the concept of international communication and to clarify the global issues and the role of new technologies and its impact on international information flow. It will help to justify major internal news agencies and media.

Course Outcomes

1. To explain the concept of international communication.
2. To analyze the global issues.
3. To assess the role of new technologies and its impact on international information flow.
4. To evaluate the functions of major internal news agencies and media houses.

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Discipline Specific Elective-8 (DSE-8)

Paper: (Group-1) Photojournalism
Subject Code:JMC094D413
L-T-P-C: 0-0-8-4
Credit Units: 4

Course Objectives

The course focuses to describe the fundamentals of photojournalism and visual communication and the ethical responsibilities of a photo journalist with incidents from the perspective of a photo journalist in order to justify photo editing and stories. It deals to clarify the principles of photo composition, Shot sizes, Camera and functions, ISO, Aperture, Shutter Speed, Lights, Lighting equipment, White Balance, Digital Color Correction and File formats.

Course Outcomes

1. To explain the fundamentals of photojournalism and visual communication
2. To determine the ethical responsibilities of a photo journalist with incidents from the perspective of a photo journalist.
3. To evaluate photo editing and stories.
4. To assess the principles of photo composition and technical aspects of photojournalism.

Paper: (Group-2) Digital Photography and Photo Editing
Subject Code:JMC094D413
L-T-P-C: 0-0-8-4
Credit Units:4

Course Objectives

The course focuses to define digital photography and its practical and theoretical aspects by clarifying the uses patterns of various software and hardware in the aesthetics of photography. It deals to justify in-depth knowledge of camera handling, lights, lens and different themes in photography in order to adapt with photo editing and printing.

Course Outcomes

1. To explain digital photography and its practical and theoretical aspects.
2. To determine the uses patterns of various software and hardware in justifying the aesthetics of photography.
3. To assess the in-depth knowledge of camera handling, lights, lens and different themes in photography.
4. To evaluate photo editing and printing.

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Paper: Dissertation**Subject Code:**JMC094C421	
L-T-P-C: 0-0-12-6	**Credit Units:** 6

Course Objectives

The course focuses to define media relatedissues to conduct media research. It will help to adapt with the relevant scientific steps involve in media research and to justify a research report by defending a Viva-voce based on their dissertation with External Examiner in the presence of the research guide. It will also help to examine a major research project independently.

Course Outcomes

1. Students would be able to explain media related issues to conduct media research.
2. To determine to apply relevant scientific steps involve in media research.
3. To evaluate research report by defending a Viva-voce based on their dissertation.
4. To analyze a major research project independently.

Anuradha Dev

Director, IQAC
The Assam Royal Global University

THE ASSAM

ROYAL GLOBAL UNIVERSITY

GUWAHATI

Royal School of Humanities and Social Sciences (RSHSS)

Department of Social Work

Learning Outcome-based Curriculum Framework for Undergraduate Programme

The Assam Royal Global University IQAC Estd : 2018

Master of Social Work

Anuradha Dev.

Director, IQAC
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Subject Name: Introduction to Social
WorkSubject Code: SOW184C101
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand social work philosophy, inculcate values to work as human service professionals and appreciate the imperatives of becoming professional social worker.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** the imperatives of becoming professional social worker.
2. **CO2-Illustrate** the Various Fields and Settings of Social Work Practice.
3. **CO3-Apply** values, ethics, knowledge, attitudes, skills and techniques required by a professional social worker working in different settings.
4. **CO4-Analyze** the professional self and persona of a professional social work.

Subject Name: Society and Indian Social Issues
Subject Code: SOW184C102
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the concept of society and social dynamics and develop a critical perspective towards contemporary social problems and enhance analytical and functional ability to work on those issues.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** the basic concepts pertaining to society.
2. **CO2-Illustrate** the contemporary social issues and required social work knowledge and competencies for intervention.
3. **CO3-Identify** the importance and relevance of culture in society.
4. **CO4-Analyze** the changing nature of society and the complexity of various social issues.

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Subject Name: Human Growth and DevelopmentSubject Code: SOW184C103
L-T-P-C: 4-0-0-4
Credit Units: 4

Course Objectives: *To understand the biological and social growth of the individual as thinking, feeling, and responding person and to develop an overall understanding of the principles of growth; their relevance and application to behaviour at various phases in the life span.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-List** the various approaches and principles of human development.
2. **CO2-Explain** the different personality theories of growth and development.
3. **CO3-Apply** physical, social and emotional aspects of development in different stages.
4. **CO4-Analyze** the models of human development.

Subject Name: Social Work Practice with CommunitiesSubject Code: SOW184C104
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand community organization as a method of social work and to develop & comprehend the concept, context and strategies of community work.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** the diverse community contexts of practice.
2. **CO2-Illustrate** the range of practice perspectives related to community work in the contemporary context.
3. **CO3-Apply** & value orientation associated with community practice
4. **CO4-Analyze** & Gain knowledge regarding theoretical underpinnings with community.

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Subject Name: Concurrent Fieldwork
Subject Code: SOW184C114
L-T-P-C: 0-0-8-4
Credit Units: 4
Scheme of Evaluation: Practical

Course Objective: *To understand the exposure to field activities to be carried out as a student social worker and to develop the student social workers to work in an open community and integrate theory into practice.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Relate** the classroom teaching into field setup.
2. **CO2-Illustrate** the Various field realities.
3. **CO3-Identify** the community issues and work on it.
4. **CO4-Analyze** the understanding of the theory and fieldwork practice.

Subject Name: Issues of North- East for Social Work Practice
Subject Code: SOW184D101
L-T-P-C: 3-0-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objective: *To understand society and culture of North-east India and to prepare the students to deal with the issues of North East India for practising social work.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** ethnicity and culture in context to the eight states of Northeast India.
2. **CO2-Explain** Northeast India's society and culture.
3. **CO3-Identify** the various Government Interventions, Programs & five year plans of Northeast India.
4. **CO4-Analyze** the social issues relating to Northeast India.

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Subject Name: Social Work Research
Subject Code: SOW184C201
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To develop competence in the skills, methods and tools in the process of social work research*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Explain** the concept of 'doing research'
2. **CO2- Develop** a blueprint of research independently
3. **CO3-Examine** the approaches of doing research
4. **CO4- Evaluate** the scope of research in social work.

Subject Name: Health and Social WorkSubject Code: SOW184C202
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the various socio-cultural and economic aspects of health in individuals and communities*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** health as a holistic concept
2. **CO2-Illustrate** the role of a social worker in the health sector.
3. **CO3- Analyze** the scope of social work intervention at different levels of healthcare
4. **CO4- Appraise** the socio-cultural causes and effects of diseases

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Subject Name: Social Work Practice with Individuals
Subject Code: SOW184C203
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To develop the knowledge and skills to work with individuals in the social system*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Find** psychological, socio-cultural and emotional causes of individual behaviour.
2. **CO2-Identify** the connection between individual problems and social systems
3. **CO3-Discover** the role of social workers in working with individuals.
4. **CO4-Analyze** the scope of therapeutic interventions in social work

Subject Name: Concurrent Field Work-II & Rural CampSubject Code: SOW182C213
L-T-P-C – 0-0-8-4
Credit Units: 4
Scheme of Evaluation: Practical

Course Objective: *To understand the basics of fieldwork, concept of self and field work and the professional role of social workers.*
Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** the role of social workers in working with individuals, groups and communities
2. **CO2- Apply** the methods learnt in theory courses on the client community
3. **CO3- Analyze** the scope of social work in dealing with social issues in the rural and urban community
4. **CO4- Assess** the need of social work professionals in non-institutional settings

Subject Name: Administration and Management of Social Welfare Organizations
Subject Code: SOW184D201
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To acquire knowledge on the basic processes for administration and management of social welfare organizations*
Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO-1**: **List** the administrative aspects of social welfare organizations
2. **CO-2**: **Explain** the various processes and procedures for the smooth functioning of welfare organizations.
3. **CO-3**: **Apply** social work skills in managing human and material resources in social welfare organizations
4. **CO-4**: **Appraise** the scope of social work interventions by organizations aimed at social welfare

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Subject Name: Social Work Practice with Groups
Subject Code: SOW184C301
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *To understand the concept of groups and its significance in the field of social work practice and to identify and acquire social work skills and techniques for the application of various group work settings.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO-1: Relate** the skills and principles of group in social work practice.
2. **CO-2: Extend** and integrate theory and practice in a way that is useful and meaningful for individuals and group settings.
3. **CO-3: Develop** inclusive tools and practice with diverse and vulnerable groups in society through various human service settings.
4. **CO-4: Analyze** and address social work practice with groups along with the values and ethics specific to social work with groups across communities.

Subject Name: Social Policy and Planning
Subject Code: SOW184C302
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *To outline the theoretical perspectives and practical knowhow underlying the concepts of social policy and planning and to develop an understanding on the implication of social policy and planning in the field of social work practice.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO-1: Relate** various social policies and its importance in the context of social work profession.
2. **CO-2: Interpret** how social polices act as a key instrument in the process of development and welfare.
3. **CO-3: Build** an understanding on the patterns of social service delivery systems and gain insight about relationship between social policy and social work practice.
4. **CO-4: Classify** polices that advances equality, human rights and socio-economic justice.

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Subject Name: Criminology & Correctional Justice System
Subject Code: SOW184C303
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *To introduce with the theories of crime and its pattern in contemporary context and aware students of the emerging idea of correction, its types and measures to prepare for professional roles of correctional justice system.*

Course Outcomes:

After successful completion of the course, the student will be able to:

1. **CO 1: Demonstrate** an understanding of the correctional Justice System and the communities affected by it.
2. **CO 2: Develop** critical thinking about justice, inequity and public safety in Indian Context.
3. **CO 3: Discover** proficiency in articulating main debates within literature in criminology as well as emerging and innovative approaches to addressing crime.
4. **CO 4: Appraise** and implement post-graduation career and learning goals.

Subject Name: Field Work (Concurrent) and Study Tour
Subject Code: SOW184C314
L-T-P-C – 0-0-8-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *The course aims at taking up independent task by students to understand the role of social work in various settings and to develop knowledge of various organizations that have come up in relation to specific problem situations in rural and urban areas.*

Course Outcomes:
After successful completion of the course, the student will be able to

1. **CO 1**: Field work in social work education helps to **relate** students for professional social work practice
2. **CO 2**: Professional social workers can **demonstrate** their learnings and experiences in their field work practice that will expand their learning and prepare them for their professional life
3. **CO 3**: Students will **make use of** their professional skills and training necessary for practice.

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Subject Name: Disaster Management (OPTION 1)
Subject Code: SOW184D301
L-T-P-C – 3-0-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objectives: *To understand the key concepts, theories and approaches of Disaster Management and to aware students regarding policies, programs, administrative actions and operations undertaken to address a natural and man-made disaster through preparedness, mitigation, response and recovery.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO 1: Find** out the critical understanding of key concepts in disaster risk reduction and humanitarian response
2. **CO 2: Compare** the specific contribution of various movement to the practice abd conceptual understanding of disaster management.
3. **CO 3: Identify** vulnerability, relationship between urbanization and disaster mitigation, hazard and family disaster preparedness.

Subject Name: Skills for Social Work Practitioners (OPTION 2)
Subject Code: SOW184D301
L-T-P-C – 3-0-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objectives: To equip students with generalist knowledge, values and skills and to prepare for entry level social work practice with diverse systems with strategies of advocacy and social change that advance social and economic justice.

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO 1: Defining** the student's social work identity including professional use of supervision and consultation, self-awareness, and an appreciation for the profession's history and values.
2. **CO 2: Demonstrate** with critical thinking skills in areas of practice, research, and ethics to help ensure success in graduate social work programs.
3. **CO 3: Develop** an understanding of working with people of diversity; including age, race, ethnicity, religion, and sexual orientation without discrimination.
4. **CO 4: Determining** the history, current realities, and future implications of social welfare system with regard to the local and global continuum.

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Subject Name: Rural and Urban Community Development (CD Specialization)
Subject Code: SOW184D30C1
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *The students will be made aware about the different conceptual and theoretical models in urban and rural community development by collaborating constructively and engage with colleagues, communities, and constituents who may have different views, values, knowledge, and expertise in rural and urban areas.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO 1: Finding** issues and examine complex causes and systems that frame urban and rural challenges.
2. **CO 2: Compare and contrast** productivity in rural and urban areas and opportunity towards a spatial balance between social and economic development.
3. **CO 3: Develop** broad based community participation in the process of development in rural and urban areas.
4. **CO 4: Critically examine** the role of social workers in socio-economic development practices in diverse environment situations.

Subject Name: Livelihood and Sustainable Development (CD Specialization)
Subject Code: SOW184D30C2
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *Design integrated development programmes towards community mobilization and community development through social work practice and to aware students about complexities of various communities and livelihood through appropriate services and intervention for individuals and communities.*

Course Outcomes:
After successful completion of the course, the student will be able to

1. **CO 1: Find** out ways in improving the livelihoods of the households and communities.
2. **CO 2: Demonstrate** meaningful community development strategies towards promoting human development in all its dimensions by creating a space for communities to participate and influence decisions which affect their lives.
3. **CO 3: Build** opportunities to facilitate, coordinate and support interventions and livelihood strategies for households and communities.
4. **CO 4: Determining** programmes towards social cohesion, promote active citizenry and community involvement in sustainable livelihood promotion and development

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Subject Name: Child and Childhood in India (FCW specialization)
Subject Code: SOW184D30F1
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *To understand the meaning, concept of growth, maturation and development at various stages of child development and to develop an understanding on the dimensions and legislations of child development and scope for integrated social work practice.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO 1: Outline** the prospects and issues of child development, especially the most vulnerable in achieving their developmental potential in various settings.
2. **CO 2: Develop** a comprehensive model towards nurturing care & child development and integrated social work practice.
3. **CO 3: Take part in** trainings and competencies to engage and counsel significant people on providing nurturing care and responsive support for children's learning & deliver quality early childhood education.
4. **CO 4: Determine** and stimulate intellectual curiosity to understand the world in which he/she lives, and to foster new interests through giving opportunities to explore, investigate and experiment.

Subject Name: Family in India (FCW Specialization)
Subject Code: SOW184D30F2
L-T-P-C – 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives: *To understand changing pattern, relations and structure in the family and issues that emerge transform. It further aims to develop in depth knowledge about the areas of family law & acts that are applicable in governing family law matters and scope for social work practice.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO 1: Compare** with the stereotypical and biased practices in family structure and system.
2. **CO 2: Develop** insights about socialization in co-relation to gender construction.
3. **CO 3: Critically** assess marriage practices in society.
4. **CO 4: Discuss** and **evaluate** various legal and constitutional measures of family planning and practices.

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Subject Name: Governance, Law, and Social Work
Subject Code: SOW184C401
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the role of legal system in India, the functioning of the government in policy formulation, the legal aid provided for the vulnerable sections of the society.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-*Find*** out the governance structures and its impacts on the communities and development.
2. **CO2-*Relate*** to the policy and legal frameworks and provisions of the various sections of the society.
3. **CO3-*Apply*** knowledge and information to educate different vulnerable sections of the society by providing legal aid/ assistance.
4. **CO4-*Criticize*** and ***Defend*** the existing policy and legal structures that can be used in the social work practise.

Subject Name: Project Dissertation
Subject Code: SOW184C421
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Practical

Course Objective: *To undertake a research project for investigating a social problem that has impact on the community as the social worker has hypothesized.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Translate** the problem statement to academic writing.
2. **CO2-Construct** research queries and **select** objectives to understand the problem.
3. **CO3-Inspect** through referring various studies and literatures by different researchers.
4. **CO4- Evaluate** and **conclude** the research study with analytical reasoning.

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Subject Name: Field Work (Block Placement)
Subject Code: SOW184C412
L-T-P-C: 0-0-8-4
Credit Units: 4
Scheme of Evaluation: Practical

Course Objective: To understand the functioning of the organisations of the social workers' specialisations' interest and learn to work in the professional environment.

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Translate** the theoretical knowledge into practise in the field
2. **CO2-Apply** values, ethics, knowledge, attitudes, skills and techniques as expected from a student social worker.
3. **CO3-Analyse** the professional self and the organisation to **compare** and **contrast** previous fieldwork experiences.
4. **CO4-Critize** or **recommend** with constructive feedback from their on-field experience.

Subject Name: Disability Studies (OPTION 1)
Subject Code: SOW184D401
L-T-P-C: 3-0-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objective: *To understand social work philosophy and inculcate values to work as human service professionals*
Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Define** the imperatives of becoming professional social worker.
2. **CO2-Illustrate** the Various Fields and Settings of Social Work Practice.
3. **CO3-Apply** values, ethics, knowledge, attitudes, skills and techniques required by a professional social worker working in different settings.
4. **CO4-Analyze** the professional self and persona of a professional social work.

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Subject Name: Peace Building (OPTION 2)
Subject Code: SOW184D401
L-T-P-C – 3-0-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objectives: *To introduce students to the specific human rights issues that come into play through the implementation of peacebuilding missions, NGO interventions, and public policy initiatives in the wake of authoritarian regimes, civil wars, and other violent conflicts. And peacebuilding at the international, national, and local levels, as well as the tensions that emerge among various actors at each of these levels.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-** To progressively introduce and **explain** students to the complexities of contexts and actors implicated in peacebuilding projects throughout the world.
2. **CO2-**To **plan** and investigate the potentials and challenges of voluntary/non-governmental organization (NGO) and grassroots initiatives towards larger national peacebuilding projects, and the various tensions that emerge between actors and institutions at the local, national, and international levels.
3. **CO3- Take part in** classroom discussion and critical analysis, ranging from post conflict economic policy to the formation of inter-sector and inter-institutional collaborations in order to advance peacebuilding policy initiatives.
4. **CO4- Evaluate** and communicate across various audiences an informed critical approach to peacebuilding and all of the complexities that such projects entail.

Subject Name: Social Entrepreneurship (CD Specialisation)
Subject Code: SOW184D40C1
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To inculcate in the students the potential and competences of a social entrepreneur theoretically*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Classify** the concepts, definition of social entrepreneurship and **relate** to the practise of social work.
2. **CO2-Identify** the similarities and differences that social work practises have with social entrepreneurship from case studies.
3. **CO3-Distinguish** entrepreneurship at global and national levels through case studies.
4. **CO4-**Learn the **importance** of new innovations in the field of entrepreneurship.

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Subject Name: Tribal Community Development (CD Specialisation)
Subject Code: SOW184D40C1
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the tribal community, their problems and the policies aimed for their welfare and development*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Classify** the tribes and **relate** the similarities and differences.
2. **CO2-Identify** the issues concerning the tribal society and **organise** the knowledge through intersectionality.
3. **CO3-Examine** the different tribal movements in India
4. **CO4**-Learn to **interpret** and **criticise** the constitutional provisions and legislative measures

Subject Name: Social Work with Women (FCW Specialisation)
Subject Code: SOW184D40F1
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the status of women in India and plan social work intervention.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Illustrate** the status of women and **translate** the indicators of women's position
2. **CO2-Identify** the issues concerning the Women and **identify** the knowledge through intersectionality.
3. **CO3-Examine** the different women movements in India
4. **CO4**-Learn to **interpret** and **criticise** the constitutional provisions and legislative measures

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Subject Name: Social Work with Youth and Elderly (FCW Specialisation)
Subject Code: SOW184D40F2
L-T-P-C: 4-0-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective: *To understand the status of youth and elderly in India and plan social work intervention.*

Course Outcomes:
After successful completion of the course, the student will be able to:

1. **CO1-Illustrate** the status of youth and elderly and **interpret** the related policies for their welfare
2. **CO2-Identify** the needs and issues concerning the youth and elderly
3. **CO3-Classify** the critical issues and problems affecting youth
4. **CO4-**Learn to **interpret** and **recommend** social work intervention for youth and elderly

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF COMMUNICATIONS AND MEDIA (RSCOM)

SYLLABUS
&
COURSE STRUCTURE

MA in Film and Television Production
MA (F&TP)
(2022 – 24)

LEARNING OUTCOME-BASED CURRICULUMFRAMEWORK

OF

ROYAL SCHOOL OF COMMUNICATIONS AND MEDIA (RSCOM)

The Assam Royal Global University IQAC Estd : 2016

Anuradha Dey

Director, IQAC
The Assam Royal Global University

SYLLABUS
(1st SEMESTER)

Paper : Introduction to Cinema Studies	**Subject Code:** FTP094C101
L-T-P-C: 4-0-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To introduce the basics of cinema studies *To know how to read a cinema *To understand the development of growth of cinema *To study the functions of electronic and new media.	*Lecture *Assignment and problem solving *Individual/Group Presentation/Case Studies	*Students will be able to read the fundamentals of film *To understand the concept of cinema studies *To analyse the various forms of cinema *To determine the generics classifications in movies.	*Continuous Evaluation: 15% *Assignment, Class Test, Viva, Seminar, Quiz: Any Three *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Development of Cinema	**Subject Code:** FTP094C102
L-T-P-C: 3-1-0-4	**Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To explore the evolution and growth of cinema *To understand the overview of International cinema *To understand the birth of Indian cinema *To understand the various dimensions in mainstream Indian cinema.	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand the evolution of cinema *To understand the development of International cinema *To classify the popular mainstream Indian cinema *To determine the birth of Indian cinema.	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : Basics of Mass Communication	**Subject Code:** FTP094C103
L-T-P-C: 3-1-0-4	**Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To explore basics of mass communication *To understand the theories of communication *To understand the evolution of media *To understand the effects of media in society	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand the fundamentals of mass communication *To understand the concept of mass communication *To apply the theories of communication *To determine the role of media in society	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Principles of Production	**Subject Code:** FTP094C114
L-T-P-C: 0-0-8-4	**Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To explore basic principles of photography *To understand the basic methods of visual communication *To understand the basic techniques of camera handling and photographic capture *To understand the language of photography and visual communication	*Field work *Assignment and problem solving *Individual/Group Presentation *Photo features	*Students will be able to understand the fundamentals of photography and visual communication *To know the techniques of camera handling *To analyze the principles of photography and visual communication *To apply the ethics in visual communication	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Elective: Discipline Specific DSE-1

Paper : (Group-1) Writing for Media	**Subject Code:** FTP094D101
L-T-P-C:4-0-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To inculcate professional writing skills and knowledge of the mass communication *To impart hands-on experience on different aspects of writing in media	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*The students will be equipped with the understanding of the principles and processes of writing for print, radio & TV	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : **(Group-2)** Visual Communication	**Subject Code:** FTP094D101
L-T-P-C: 4-0-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To introduce the knowledge of visual thinking, understanding of semiotics languages *To give hands-on training in different aspects of visual elements in mediated contents etc.	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*To explore and understand the visual concept and its meaning in different elements of video, print and new media context	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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SYLLABUS (2nd SEMESTER)	
Paper : Language of Cinema	**Subject Code :** FTP094C201
L-T-P-C: 3-1-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To explore basics terminologies of cinema *To understand the techniques in cinematography *To understand the dimensions of sound in visual communication *To understand the various classifications of genre in cinema	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to read the basics of cinema *To understand the processes of lightings in cinema *To classify the various types of cinema *To determine the generics classifications in movies	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Media Research	**Subject Code:** FTP094C202
L-T-P-C : 3-1-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To develop media research culture among academics and professionals in different fields *To undertake research in their specific academic fields on philosophical, epistemological understanding of the elements of research *To provide knowledge skills of various types of research designs and its procedures to conduct research to meet the national and international requirements	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to demonstrate the ability to think critically, creatively and independently *To write clearly in scholarly research and journalism professionals to serve the purpose *To critically evaluate in-depth information from diverse sources	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : TV News Reporting and Production	**Subject Code:** FTP094C203
L-T-P-C: 4-0-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To explore the elements of news reporting *To understand the basics of television production *To understand the techniques of writing for visuals *To understand the various dimensions in the mainstream TV news channels in India	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to know the process of TV news reporting *To understand the journalistic values of TV news reporting *To classify the steps in TV programme productions *To know the functions of mainstream national and international TV news channels	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Film Studies	**Subject Code:** FTP094C204
L-T-P-C: 3-1-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To understand the theories of film *To understand the aesthetics of story composition *To understand the core concepts of cinema *To understand the importance of discourse on cinema	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand different theories and their importance in cinema *To understand the aesthetics of story telling *To classify the different genres of cinema *To apply determine the aesthetics of visual formats in media	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Discipline Specific Elective-2 (DSE-2)

Paper : (Group-1) Lighting for Films	**Subject Code:** FTP094D211
L-T-P-C: 0-0-8-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To introduce lighting in cinema *To understand the techniques in lighting *To learn various principles and techniques of photography *To learn lighting technique and aesthetics of imaging	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand the basics of lighting in cinema *To practice the techniques of lighting in films *To various principles involve in lighting for films *To determine the aesthetics of imaging in cinema	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : (Grou-2) Computer Application (Design and Editing)	**Subject Code:** FTP094D211
L-T-P-C: 0-0-8-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To know the features that distinguish different types of graphics applications and design processes *To develop digital media and freehand drawing skills to support design communication and thinking processes	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*To be able to gain technical skills for digital and traditional types of composition	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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SYLLABUS
3rd SEMESTER

Paper : Specialization in TV and Film Making **Subject Code:** FTP094C301
L-T-P-C: 4-0-0-4 **Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To understand the basics of filmmaking *To understand the techniques in independent filmmaking *To understand the overview of tv journalism *To understand the processes in tv broadcasting	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	* Students will be able to understand the cinematic techniques in filmmaking *To understand the whole apparatus of independent filmmaking *To know the processes in TV Journalism *To know the power of TV and film in society	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Techniques of Film and Television Production **Subject Code:** FTP094C302
L-T-P-C: 3-1-0-4 **Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To study the major industrial, technological aesthetics and cultural developments in the history of motion pictures *To understand film industry and audience, narratives of film, developments of cinematic techniques and film as art *Changing paradigms of cinematic realism and its technological innovations *The online course in Swayam is suggested for learning Film Studies	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Able to understand the nature and process of film production *To familiarize theoretical ideas in films *To explore aesthetics in the history of cinema	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : Video Editing **L-T-P-C:** 0-0-8-4	**Subject Code:** FTP094C313 **Credit Units** : 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To introduce the art of video post-product *To imply the theory and practice of editing styles to narrate stories in the editing room *To demonstrates hands-on experience in advanced editing techniques with in-depth examination of Final Cut Pro and Adobe Premier	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*After completing the course students would be able to know hoe video content produced *To ideate and plan a film and edit accordingly *To clear the requirements in editing films	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Discipline Specific Elective-3 (DSE-3)

Paper: (Group-1) Online Journalism **L-T-P-C:** 3-1-0-4	**Subject Code:** FTP094D301 **Credit Units** : 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To introduce Internet and World Wide Web from the perspective of online journalism *To employ multimedia tools like digital audio recorders, video recorders, cameras and GSM phones to tell stories and its effects in society *To introduce the techniques of journalism in digital media and its conceptual tools *To provides the basics of online publishing and writing	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to understand the history and its development of Internet and the World Wide Web; *To understand the differences and similarities between reporting and publishing offline and online techniques	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : (Group-2) Global Communication **L-T-P-C:** 3-1-0-4	**Subject Code:** FTP094D301 **Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To introduce different forms of global media and its impact *To imply theoretical approach to social network sites, social interaction, mobile phones activism *To know the trends in multimedia and digital media, technology uses for interaction in global communication	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to understand the global communication process and its impact on culture *To understand satellite and mobile technologies *To understand live streaming and podcasting technologies	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Discipline Specific Elective-4 (DSE-4)

Paper : (Group-1) Basics to Advertising **L-T-P-C:** 3-1-0-4	**Subject Code:** FTP094D302 **Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To explored different areas of advertisement *To give in-depth knowledge of the principles and practices of advertising *To know mysteries of marketing agency structures and advanced advertising practices	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students would be able to understand the different types of advertisements and to produce advertisement for radio, television and print media *To identify the various elements and components of advertising	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : (Group-2) Corporate Communication	**Subject Code:** FTP094D302
L-T-P-C: 3-1-0-4	**Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To introduce the concepts of corporate communication *To explore image and reputation building management *To know case studies and crises management	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to understand the community relations, customer, vendor and dealer relations *To use various communication tools for crisis management *To understand the legal and ethical issues in the Corporate Communication	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Discipline Specific Elective-5 (DSE-5)

Paper : (Group-1) Layout and Design	**Subject Code:** FTP094D313
L-T-P-C: 0-0-8-4	**Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
*To introduce graphic designing and layout *To employ digital technology and software used in graphic designing *To know the importance of graphics in communication process	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students would be able to create effective layout and designs for newspapers and magazines *To cater skills and techniques of graphics designing	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : (Group-2) BROADCAST MEDIA TV	
Subject Code: FTP094D303	
L-T-P-C: 4-0-0-4	**Credit Units :** 4

Course Objectives	**Teaching Learning Process**	**Learning Outcomes**	**Course Evaluation**
1. To understand the development of Broadcast Journalism. 2. To understand the importance of Regional Journalism in Broadcast Media 3. To learn to write in Broadcast Format conforming to the ethical and practical principles that guide it. 4. To introduce briefly the concepts of Convergence.	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Internship	**Subject Code:** FTP094C321
L-T-P-C: 0-0-8-4	**Credit Units :** 4

Objective:

Students will undertake four weeks' internship either in Cinema or TV production houses (e.g. Film industry, TV Channel, production house, ad agency, IT Company, NGO and research firm etc.) at the end of second semester. Each student shall make a written presentation on his/her experiences achievement and learning which he/she had during the period of internship. Students will be evaluated based on the feedback received from the training institute, student's presentation and a detailed report.

Course Outcome:

- The students will be able to understand the functioning of the cinema and TV production unit which they opted to intern with
- The students after the course will start thinking as a professional and not a student
- After the training, the students will further explore and specialise in the field they worked

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SYLLABUS
(4th SEMESTER)

Paper : Film Appreciation	**Subject Code:** FTP094C401
L-T-P-C: 3-1-0-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To introduce film appreciation *To learn cinematic storytelling *To learn the application of film theories *To learn the techniques of popular film critics	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand the basics of film appreciation in media *To understand the methods in cinematic storytelling *To apply the theories in cinema studies *To apply the techniques of film analysis in cinema studies	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : Individual Film Project	**Subject Code:** FTP094C402
L-T-P-C: 0-0-8-4	**Credit Units** : 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To understand the concept of filmmaking *To learn through fieldwork while making the project *To develop the idea of independent content creation *To implement the learnt theories in practical	* Practical *Assignment and problem solving *Individual/ Group Presentation * Research for the content	*Students will be able to understand the basics of film making *To understand the impact of cinema in society *To know the power of cinema in media	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Discipline Specific Elective-6 (DSE-6)

Paper : (Group-1) Photojournalism **Subject Code:** FTP094D411
L-T-P-C: 0-0-8-4 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To know the fundamentals of photojournalism and visual communicators *To determine the basic instruction, demonstration, and samples of the desired outcomes *To create and maintain a blog/website to display photographic works	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to know the applications of videos in photo assignments *To select a theme or subject on news production	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : (Group-2) Digital Photography and Photo Editing **Subject Code:** FTP094D411
L-T-P-C: 0-0-8-4 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To enhance knowledge of digital photography *To impart practical understanding and theoretical aspects of photography *To know the uses patterns of various software and hardware in the aesthetics of photography	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*To provide in-depth knowledge of camera handling, lights and lens *To understand the different photography themes *To understand the photo editing skills and printing	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Discipline Specific Elective-7 (DSE-7)

Paper : (Group-1) Media Laws and Ethics **L-T-P-C :** 4-0-0-4	**Subject Code:** FTP094D402 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To provide the basic understanding of Media and legal system *To know the principles and concepts of ethics in moral reasoning and solve ethical issues in media *To understand the impact of internet in journalism and regulations of new communication technology *To know the legal frameworks of their rights and responsibilities as journalists	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*To understand the legal and ethical issues in media *To understand and analyze the important legal and ethical issues involved in mass media industry *To apply the legal frameworks of rights and responsibilities as journalists	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper : (Group-2) International Communication **L-T-P-C:** 4-0-0-4	**Subject Code:** FTP094D402 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To provide an understanding of the concept of international communication *To understand the global issues and the role of new technologies and its impact on international information flow	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Would be able to understand the concept of International communication *To understand new technologies and its impact on international information flows	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Discipline Specific Elective-8 (DSE-8)

Paper : (Group-1) Aesthetics in Cinema Studies **Subject Code:** FTP094D403
L-T-P-C: 4-0-0-4 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To introduce film aesthetics *To learn the elements of visual aesthetics *To learn the elements of aesthetics in film form *To learn the theories of aesthetics	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*Students will be able to understand the basics of film aesthetics *To understand the elements of visual aesthetics *To understand the elements of aesthetics in film form *To apply the theories of aesthetics in film and TV programmes	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

Paper: (Group-2) Cinema in Northeast India **Subject Code:** FTP094D403
L-T-P-C: 4-0-0-4 **Credit Units :** 4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*To understand the development of cinema in India and NE *To learn the facets of NE cinema *To learn the elements of critical theories *To learn the applications of new media and animation	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	* Students will be able to understand the development of cinema in NE India *To understand the facets of NE cinema *To understand the basics of critical theory *To theoretical perspectives in NE cinema	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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Paper : Dissertation	**Subject Code:** FTP094C421
L-T-P-C: 0-0-12-6	**Credit Units :** 6

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
*Master Dissertation: Each student will be assigned any Media related issues for research study at the beginning of the semester *To know how to execute dissertation *To conduct independent media research *Viva-voce based on dissertation has to be conducted by the External Examiner, in the presence of the research guide	*Lecture *Assignment and problem solving *Individual/Group Presentation *Case Studies	*The students would be able to work independently with minimal supervision *The course module would assist students to work on a major research project	*Continuous Evaluation: 15% *(Assignment, Class Test, Viva, Seminar, Quiz: Any Three) *Mid-term examination: 10% *Attendance:5% *End Term Examination: 70%

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF LIFE SCIENCE(RSLSC)

DEPARTMENT OF ZOOLOGY

LEARNING OUTCOME FOR CURRICULUM FRAMEWORK
(LOCF)

SYLLABUS

&

COURSE STRUCTURE

M.Sc. Zoology

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SEMESTER-I
Paper/Subject Name: Biosystematics & Taxonomy **Subject Code:** ZOO144C101 **L-T-P-C:** 3-1-0-4 **Credit Units:** 4 **Scheme of Evaluation:** Theory

Course Objectives:

To provide basic concepts of biosystematics & taxonomy and to exercise various taxonomic characters in identification and categorization of animals among various taxonomic hierarchy.

Course Outcomes:

BT1: Identify the various taxonomic characters that are vital in identification and naming of animals.

BT2: Describe the various methods that govern the process of taxonomic categorization and biological classification.

BT3: Apply the basic knowledge to interpret the various taxonomic keys in identification and classification of animals among different taxa.

BT4: Analyze different methods that can be implemented to decipher biodiversity indices.

BT5: Summarize different components of taxonomic knowledge in identifying a new species in a natural ecosystem.

SEMESTER-I
Paper/Subject Name: Animal Physiology **Subject Code:** ZOO144C102 **L-T-P-C:** 3-1-0-4 **Credit Units:** 4 **Scheme of Evaluation:** Theory

Course Objectives:

To build understanding regarding various anatomical features of organs and elucidate the organ level functioning related to nervous, respiratory, cardiovascular, excretory, and digestive etc.

Course Outcomes:

BT1: Recall various processes that are vital in understanding the underlying concepts of physiology.

BT2: Describe the various methods that govern various life processes such as nervous, respiratory, cardiovascular, excretory, and digestive functions etc.

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BT3: Apply the basic knowledge to interpret the various life processes such as functioning of nervous system, respiratorysystem, cardiovascular system, excretorysystem, and digestive system etc.

BT4: Analyze the acquired concepts of various physiologicalprinciples atthe basic and applied levels.

BT5: Relate physiological processes from the biochemical to the system level unto thefunction of the entire organism in its environment.

Semester-I
Paper/Subject Name: Cell Biology
Subject Code: ZOO144C103
L-T-P-C- 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Theory

COURSE OBJECTIVE:

To help the students learn and develop an understanding of the cell as a basic unit of life, the functions of cellular organelles, how a cell carries out and regulates cellular functions and their role in disease condition due to malfunctioning of cellular processes.

LEARNING OUTCOMES:

Upon completion of the course, students should to be able to:

BT1: Identify the different structural and functional components of the cell.

BT2: Explain the structure and functions of cell organelles involved in diverse cellular processes.

BT3: Apply the knowledge of cellular process and its regulation in understanding the process of cancer and microbial physiology.

BT4: Point out the roles of various genes responsible for various kinds of cell signalling processes.

BT5: Construct a spider diagram indicating the involvement of various genes and their regulatory factors for a particular disease condition

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Semester-I
Paper/Subject Name: Genetics
Subject Code: ZOO144C104
L-T-P-C- 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives:

To highlight extension of Mendelian Genetics, dosage compensation, evolution of the concept of gene and its amalgamation with molecular biology and study of genetic diseases.

Learning Outcome:

BT1: Describe how genetic information is passed on in eukaryotes and prokaryotes, how genes work together in a complex manner in biological system and any alteration can lead to major phenotypic change.

BT2: Review the various mechanisms of gene mutation and epigenetics.

BT3: Predict the mode of transmission of diseases with the help of pedigree analysis.

BT4: Identify the role of various physical and chemical factors in causing mutation in organisms

BT5: Devise a technique to detect mutagen induced genetic abnormalities in different animal models.

Semester-I
Paper/Subject Name: Taxonomy, Animal Physiology, Cell biology and Genetics (Practical)
Subject Code: ZOO144C115
L-T-P-C- 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Practical

Course Objective:

To provide the students basic hands on training on microscopy, their use in studying cells and theirvariability, basic understanding of different bioparameters of human physiological processes

Course Outcomes

BT1: Recall the different vertebrate and invertebrate groups and the general characteristics of the phylum they belong to.

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BT3: Prepare taxonomic keys observing various naturally available organisms

BT4: Relate the concepts of various biodiversity indices and analyze the biodiversity of a particular region.

BT5: Summarize different components of taxonomic knowledge in identifying a new species in a natural ecosystem.

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Semester-I
Paper/Subject Name: Parasitology
Subject Code: ZOO144D101
L-T-P-C- 2-1-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objective:

To provide students with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans enabling them to understand the pathogenesis, clinical presentations and complications of parasitic diseases and to reach diagnosis, prevention and control of parasitic infections.

Course Outcomes:

BT1: Recall the concepts of parasitism, zoonosis, host and host parasite interaction.

BT2: Describe the epidemiology of important parasitic infections and the effect of social and demographic patterns on parasitic disease.

BT3: Apply the knowledge of parasitology on life-threatening conditions caused by helminths and protozoans with regards to etiology and life cycle of parasites of medical importance.

BT4: Analyze the immunological and molecular methods used for diagnosis of parasitic infections and methods of recovery from parasitic infection.

BT5: Summarize host parasitic interaction and defence mechanism adopted by parasites and hosts against each other.

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Semester-II
Paper/Subject Name: Population Genetics and Evolution
Subject Code: ZOO144C201
L-T-P-C- 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objectives

To acquaint the students on concepts and theories of evolution and understand the importance of studying population genetics in realizing the mechanism of evolution

Course Outcome

BT1: Describe the process of origin of life on earth and the various theories put forwarded by researchers to understand the process leading to evolution.

BT2: Explain the concepts of Darwinism, Neo Darwinism, and Hardy Weinberg law to understand the concept of evolution of life.

BT3: Apply the concepts of Natural selection,mutation, genetic drift, migration, meiotic drive to understand evolution of eukaryotes and prokaryotes.

BT4: Analyze the roles played by genes and proteins in driving molecular evolution.

BT5: Relate the various concepts of evolution and molecular biology to understand the phenomenon of extinction.

Semester-II
Paper/Subject Name: Developmental Biology
Subject Code: ZOO144C202
L-T-P-C- 3-1-0-4
Credit Units: 4
Scheme of Evaluation: Theory

Course Objective:

To learn about heterogamy in eukaryotes, fertilization, biology of sex determinationand understand the process of fertilization and other assisted reproduction techniques

Course Outcomes:

BT1: Recall the basic concepts of spermatogenesis, oogenesis , fertilization and sex determination.

BT2: Review the concepts of various fertilization events and identify the various techniques of In Vitro Fertilization.

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BT3: Apply the knowledge of reproductive biology in understanding assisted reproductive technologies, generation of transgenic animals, contraceptive mechanisms and teratogenesis.

BT4: Analyze the various mechanisms of genetic and molecular regulation of gametogenesis and fertilization.

BT5: Summarize the various technological concepts of reproductive biology.

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SEMESTER-II

Paper/Subject Name: Environmental Physiology

Subject Code: ZOO144C203

L-T-P-C: 3-1-0-4

Credit Units: 4

Scheme of Evaluation: Theory

Course Objectives:

To make student's awareregarding the plethora of physiological adaptations that animals can show while responding to ever changing environmental stimuliand is basically an animal physiology course, taught from an ecological andevolutionary perspective.

Course Outcomes:

BT1: Recognize various ecological processes that govern the underlying concepts of environmental physiology.

BT2: Describe numerous natural processes and mechanisms for physiological adaptation of animals in environmental context.

BT3: Apply concepts (on gas exchange, acid-base regulation, water balance,ion/osmotic regulation, and temperature effects/thermoregulation) to explain therelationship between an animal's physiology and their environmental conditions.

BT4: Analyze and draw relationships among various physiological, biochemical and environmental adaptations of organisms that enable them to survive environmental extremes.

BT5: Write various examples of physiological solutions to problems, such as animals invarious and extreme environmental conditions or animals exhibiting unique lifehistory strategies.

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SEMESTER-II
Paper/Subject Name: Biostatistics and Bioinformatics **Subject Code:** ZOO144C204 **L-T-P-C:** 3-1-0-4 **Credit Units:** 4 **Scheme of Evaluation:** Theory

Course Objectives:

To impart knowledge to students on the most important skill which is required to use computer programs for the daily design of experiments, data collection, and analysis of results as well as hands on practical exercises on various computer programming.

Course Outcomes:

BT1: State various computer applications that are employed to retrieve various biological data.

BT2: Describe various biological database namely EMBL, SWISS-PROT, Pub-Med etc. that are useful in the field of bioinformatics.

BT3: Apply knowledge to evaluate various sequence analysis and alignment techniques.

BT4: Illustrate different tools related to bioinformatics and also outline various biostatistical tools that can be used to arrange and analyze biological data.

BT5: Construct a Phylogenetic tree using the knowledge of bioinformatics and biostatistics.

Semester-II
Paper/Subject Name: Evolution, Developmental Biology, Environmental Physiology, Biostatistics and Bioinformatics (Practical) **Subject Code: ZOO144C215** **L-T-P-C- 0-0-8-4** **Credit Units: 4** **Scheme of Evaluation: Practical**

Course Objective

To provide the students basic hands-on training on microscopy, their use in studying cells and theirvariability, basic understanding of different bio parameters of human physiological processes.

Course Outcomes

BT1 : To understand about the embryological development in species.

BT2 : Identify the different allele frequency and genotype frequency

BT3 : Prepare phylogenetic tree for DNA and Protein

BT4 : Relate the nucleic acid and protein sequence databases.

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SEMESTER-II
Paper/Subject Name: Animal Behaviour
Subject Code: ZOO144D202
L-T-P-C: 2-1-0-3
Credit Units:3
Scheme of Evaluation: Theory

Course Objectives:

To provide the basic foundations of the field of Behavioural biology as well as current theories and evidence pertaining broad range of behavioural topics.

Course Outcomes:

BT1: Define various fundamental processes that regulate behaviour.

BT2: Explain different theories and underlying principles of animal behaviour.

BT3: Apply knowledge to interpret the different behavioural mechanisms displayed by organisms.

BT4: Classify various behaviours performed by animals in their natural habitats.

BT5: Evaluate the underlying mechanisms of various kinds of behaviour such as aggression, territoriality, parental care, migration etc.

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SEMESTER-III
Paper/Subject Name: Molecular Biology **Subject Code:** ZOO144C301 **L-T-P-C**: 3-1-0-4 **Credit Units:**4 **Scheme of Evaluation:** Theory

Course Objectives:

To make students understand about nucleic acids, structures of DNA and RNA, mechanism of transcription, organization of chromosomes and introduce the students to the central dogma of the cell which includes replication, mRNA synthesis and the protein synthesis machinery of the cell.

Course Outcomes:

BT1: Recall the structure of nucleic acids and the structure of DNA double helix and the experiments leading to the discovery of various properties and functions of DNA.

BT2: Summarize the various cellular and molecular processes leading to various important pheromena of the cell which includes replication, transcription and translation.

BT3: Point out the structure and functions of various enzymes involved in replication, transcription and translation along with the regulation of those processes.

BT4: Differentiate between the processes of replication, transcription and translation between eukaryotes and prokaryotes.

BT5: To revise the various concepts of gene regulation such as gene silencing, splicing etc.

SEMESTER-III
Paper/Subject Name: Basics of Biotechnology **Subject Code:** ZOO144C302 **L-T-P-C**: 3-1-0-4 **Credit Units:**4 **Scheme of Evaluation:** Theory

Course Objectives:

To gain a comprehensive understanding of the principles underlying the various techniques used in genetic engineering, molecular cloning ,cloning vectors, DNA amplification and analysis, various techniques used in bioprocess engineering and technology and bioinformatics.

Course Outcomes:

BT1: Recall the basic concepts of biotechnological tools used in molecular genetics such as restriction enzymes and their types, cloning vectors, fermentation, proteomics etc.

BT2: Discuss the mode of action of various restriction enzymes, nature and properties of various kinds of cloning vector and principles of operation of various techniques.

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BT3: Apply the knowledge of biotechnology in understanding the processes of gene transfer, transformation genetics, microarray technology and bioprocess engineering.

BT4: Categorize the various types upstream and downstream processes in industrial biotechnology.

BT5: Formulate various techniques that may be used in industrial biotechnology in-order to facilitate the up streaming, mid stream and downstream of various products.

SEMESTER-III
Paper/Subject Name: Molecular Biology and Biotechnology (Practical)
Subject Code: ZOO144C313
L-T-P-C: 0-0-8-4
Credit Units:8
Scheme of Evaluation: Practical

Course Objectives:

To understand the various processes relating to molecular biology and biotechnology.

Course Outcomes:

BT1: Recall the basic concepts and principles of microscopy, DNA and RNA structure and function.

BT2: Describe the principles of processes like PCR, gel electrophoresis, bacterial culture.

BT3: Apply the concepts and principles of DNA and its structure to isolate DNA from plant and animal sample.

BT4: Analyze the results of the experiments performed using statistical and graphical techniques.

BT5: Summarize the various techniques of PCR and bacterial culture.

SEMESTER-III
Paper/Subject Name: Pest Management.
Subject Code: ZOO144S321
L-T-P-C: 2-0-0-2
Credit Units:2
Scheme of Evaluation: Theory

Course Objectives:

To make the students aware of the basic pest species and to impart knowledge on biological control of pest.

Course Outcomes:

BT1: Identify and define basics concepts of pest management.

BT2: Distinguish and recognize various pest species affecting man and livestock.

BT3: Interpret the methods and demonstrate collection of pest

BT4: Examine the Integrated Pest Management technique and compare it with existing chemical management techniques.

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SEMESTER-III
Paper/Subject Name: Fish Biology- I **Subject Code:** ZOO144D301 **L-T-P-C**: 2-1-0-3 **Credit Units:** 3 **Scheme of Evaluation:** Theory

Course Objectives: To give a general idea of fish and its various group and to know about different parameters thateffect the growth of fish.

Course Outcomes:

BT1 : Recall the basic idea about classification of Class Pisces.

BT2 : Review the different parameters that effect the growth of fish.

BT3 : Interpret the various concepts of fish physiology.

SEMESTER-III
Paper/Subject Name: Ecology and Wildlife Biology- I **Subject Code:** ZOO144D302 **L-T-P-C**: 2-1-0-3 **Credit Units:**3 **Scheme of Evaluation:** Theory

Course Objectives:

To equip student with the basics of ecology, principles of community and population, various aspects of socio-biology and environment degradation and its impacts on the biodiversity.

Course Outcomes:

BT1: Recall the various scopes and aspects of Population and Community Ecology.

BT2: Review the various concepts of behavioural ecology.

BT3: Interpret the effects of various environmental contaminants on the ecosystem.

BT4: Analyze the various interspecific and intraspecific interactions existing in an ecosystem.

BT5: Develop a plan to summarise the roles of various bioindicators and biomarkers responsible for determining environmental health.

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SEMESTER-III
Paper/Subject Name: Cell Biology and Genetics- I
Subject Code: ZOO144D303
L-T-P-C: 2-1-0-3
Credit Units: 3
Scheme of Evaluation: Theory

Course Objectives:

To help the students to learn and develop an understanding of the cell as a basic unit of life, the functions of cellular organelles and regulation of its functions, chromosomal abnormalities and their pattern of inheritance of a particular character in lineages.

Course Outcomes:

BT1: Recall the structural and functional organization of cell membrane, cell organelles and microbial genes.

BT2: Describe the cellular and molecular processes involved in transport across plasma membrane, oxidative phosphorylation, cell cycle and gene mutation.

BT3: Illustrate the process of molecular regulation of cell cycle and apply the knowledge in understanding cancer and its progression.

BT4: Identify the various genes and proteins responsible for regulation of plasma membrane transport, apoptosis and cancer.

BT5: Reorganise the concepts of cell cycle regulation helping to identify various important biomarkers involved in cancer and its progression.

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SEMESTER-III
Paper/Subject Name: Environmental Toxicology I **Subject Code:** ZOO144D304 **L-T-P-C**: 2-1-0-3 **Credit Units:** 3 **Scheme of Evaluation:** Theory

Course Objectives:

To provide toxicological information at an introductory level while combining enough comprehensive information to meet the needs of more advanced applied knowledge as well as extend the expertise in the field of Environmental toxicology.

Course Outcomes:

CO1: Recall various fundamental principles of 'toxicology' as a scientific discipline.

CO2: Acquaint students with types of toxicants and factors affecting toxicity.

CO3: Cover mechanistic aspects of absorption & distribution of toxicity.

CO4: To enable students to develop critical thinking with regard to impact of various environmental contaminants on biosphere.

SEMESTER-IV
Paper/Subject Name: Biochemistry of Metabolic processes **Subject Code:** ZOO144C401 **L-T-P-C**: 3-1-0-4 **Credit Units:** 4 **Scheme of Evaluation:** Theory

Course Objectives:

To construct a concept map regarding the interaction, network and regulation of various important metabolic pathways and their role in health and diseases.

Course Outcomes:

1. Recall various fundamental metabolic processes and their regulation to maintain body homeostasis.
2. Explain different metabolic pathways and their underlying mode of action.
3. Apply knowledge to interpret the cross talk between various metabolic pathways.
4. Examine the role of different pathways and the network by which all of them are interconnected
5. Deduct the key pathways as well as key players that may lead to various diseased conditions.

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SEMESTER-IV
Paper/Subject Name: *Immunology*
Subject Code: ZOO144C402
L-T-P-C: 4-0-0-4
Credit Units:4
Scheme of Evaluation: Theory

Course Objectives:

To help students develop skills necessary for critical analysis of essential elements of the immune system related to health and disease and molecular as well as cellular components and pathways that protect an organism from infectious agents or cancer, also emphasizes the research and development opportunities for therapeutic intervention arising from recent advances in immunology.

Course Outcomes:

BT1: Recall various concepts of immune system and related terminologies necessary to understand the course.

BT2: Explain the various mechanisms of immune cell responses and necessary activation of various arms of immune system.

BT3: Apply properly acquired knowledge to interpret the cross talk between various pathways of immune action.

BT4: Analyze the roles of cytokines and other chemical messengers in the proper regulation of immune action.

BT5: Explain the role of important therapeutic techniques and vaccines in the field immunobilogy.

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SEMESTER-IV
Paper/Subject Name: Biochemistry and Immunology (Practical) **Subject Code:** ZOO144C413 **L-T-P-C**: 0-0-8-4 **Credit Units:**8 **Scheme of Evaluation:** Practical

Course Objectives:

To train students with various laboratories based skills like identification of biomolecules such as carbohydrates, proteins and amino acids along with several haematological parameters.

Course Outcomes:

BT1: Recall various handling techniques like microscope, preparation of reagents etc.

BT2: Explain various methods of separation of various biomolecules.

BT3: Apply knowledge to isolate biomolecules to carry out chromatography, gel electrophoresis etc.

BT4: Analyze different haematological parameters including, RBC and WBC count.

BT5: Summarize all the experimental records and evaluate the results.

SEMESTER-IV
Paper/Subject Name: Fish Biology- II **Subject Code:** ZOO144D401 **L-T-P-C**: 2-1-0-3 **Credit Units:**3 **Scheme of Evaluation:** Theory

Course Objectives:

To understand the basic principles of genetics and breeding and their applicationto fisheriesmanagement and aquaculture.

Course Outcomes:

BT1: What are the underlying genetic principles that cause diversification of fishes?

BT2: Explain various genetic and molecular techniques that are employed to improve the quality of the cultured fishes.

BT3: Identify various factors that determine fish growth and the methods of assessment of the growth rate in fishes.

BT4: Examine the various biochemical and molecular techniques in fishery and their applications in cultured fisheries.

BT5: Evaluate different factors that can affect the fish growth and development during fish genetic engineering.

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SEMESTER-IV
Paper/Subject Name: Ecology and Wildlife Biology- II **Subject Code:** ZOO144D402 **L-T-P-C:** 2-1-0-3 **Credit Units:**3 **Scheme of Evaluation:** Theory

Course Objectives:

To introduce the various important issues related to wildlife such as habitat destruction, endangered species,wildlife management practices, conservation and public awareness and positive ethics and support.

Course Outcomes:

BT1: Recall some of the burning issues related to ecology and wildlife management.

BT2: Explain scientific and biological principles as they pertain to wildlife.

BT3: Identify, formulate, and solve complex environmental issues.

BT4: Examine the in-depth knowledge of niche requirements, home range and habitat ecology and identify the governing principles influencing it.

BT5: Evaluate the reasons for current biodiversity loss and identify the conflicts between wildlife and humans.

SEMESTER-IV
Paper/Subject Name: Cell Biology and Genetics- II

Subject Code: ZOO144D403 **L-T-P-C:** 2-1-0-3 **Credit Units:**3 **Scheme of Evaluation:** Theory

Course Objectives:

To provide knowledge about the complex organization of eukaryotic cell and the molecular mechanisms of the cellular processes that exist in all cell types.

Course Outcomes:

BT1: Recall various fundamental principles that regulate the functionality of a cell.

BT2: Classify various organizational attributes that helps a cell to grow, divide, survive and finally to die.

BT3: Identify various finely tuned processes such as Cell signalling, cell cycle regulation, apoptosis etc. and illustrate how they are pivotal cell growth and survival.

BT4:Analyze the molecular mechanism responsible for cell movement and how it is being accomplished.

BT5: Conclude how defects in functioning of cell organelles and regulation of cellular processes can develop into diseases.

SEMESTER-IV
Paper/Subject Name: Environmental Toxicology II **Subject Code:** ZOO144D404
L-T-P-C: 2-1-0-3 **Credit Units:** 3 **Scheme of Evaluation:** Theory

Course Objectives:

To provide toxicological information at an introductory level while combining enough comprehensive information to meet the needs of more advanced applied knowledge as well as extend the expertise in the field of Environmental toxicology.

Course Outcomes:

CO1: Recall previous knowledge towards more advanced avenues of the subject.

CO2: Acquaint students with various processes of biotransformation and elimination of the toxicants.

CO3: Mechanistic aspects of organ target toxicity and diseases.

CO4: To enable students to develop critical thinking about the interconnected web of interactions of contaminants with the environment.

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF ENVIRONMENTAL & EARTH SCIENCES

(RSEES)

DEPARTMENT OF GEOLOGY

COURSE STRUCTURE & SYLLABUS

M.Sc. Geology

w.e.f. 2022-23

The Assam Royal Global University
IQAC
Estd : 2018

Anuradha Das

Director, IQAC
The Assam Royal Global University

M. Sc. Course in Geology: Semester-I

Paper I Core Course	STRUCTURAL GEOLOGY			Subject Code: GEOL.164C101
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The main objectives of this programme are to understand the lithological and structural mapping of a terrain and correlate with available deformation sequence and also to identify basic structural elements and to interpret the complex geometry in crustal terrain as well as investigate the deformation structures within rocks from mesoscopic to microscopic scale.

Course Outcome:

By the end of this course the students will be able to:

1. Describe the behaviour of rocks under different stress and strain regimes.
2. Explain various processes involved in the formation of the topographical features and classify the structures on the basis of different parameters.
3. Compare between micro-, meso- and macro-structures.

Paper II Core Course	GEOMORPHOLOGY			Subject Code: GEOL164C102
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: The objective of this course is to study the landforms and landform evolution. This course would help in understanding the basic concept of time scales of landscape analysis, to know the various parameters on geomorphic systems, and also to understand the applicability of Fluvial geomorphic system and Tectonic geomorphology.

Course Outcome: By the end of this course the students will be able to:

1. Understand the landforms as the unit of systematic analysis.
2. Explain the relationship between geometric perspective and its dimensions in Geology with the physical surrounding.
3. Illustrate and explain geomorphology of India at different timescales with respect to tectonic geomorphology.

Paper III Core Course	MINERALOGY AND CRYSTAL CHEMISTRY			Subject Code: GEOL164C103
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

Mineral's identification is necessary to study and understand about the rocks as well as different structures, textures, associations and origins. As the minerals are crystalline in nature, so it is also important to have in-depth knowledge of crystallography.

Course Outcome: By the end of this course the students will be able to:

1. Describe the basic chemistry involved in mineral formation and structures.
2. Identify and classify common rock forming minerals.
3. Identify the most common elements in Earth's crust and their order of abundance.

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Paper IV Core Course	PRACTICAL I			Subject Code: GEOL164C114
	L-T-P-C: 0-0-3-3	Credit Units: 3	Scheme of Evaluation: (P)	

Course Objectives:

The objective of this course is to develop skills on plotting the structural data on stereographic projections. Reading and interpretation of topographical maps, weather maps, Drawing and interpretation of graphs and preparation of qualitative and quantitative thematic maps, understand the mineral science, its formation and characteristics.

Course Outcome:

After the completion of course, the students will have ability to:

- Construct profile sections and interpret geological maps of different complexities
- Plot mesoscopic structural data on stereographic net and interpret topographic maps for different landforms.
- Identify the silicate minerals under microscope and determine the different physical as well as the optical properties.

Paper: DSE 1 Discipline Specific Elective	CLIMATOLOGY AND OCEANOGRAPHY			Subject Code: GEOL164D101
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The primary goal of this paper is to provide information regarding the atmospheric conditions, resultant weather and climates and its evolution with time and it's impacts on the planet earth. Morever, it deals with the ocean's ancient history, its current condition and the future, ocean floor topography and the available marine resources.

Course Outcome:

After the completion of course, the students will have the ability to:

1. Understand the various weather and climatic conditions and its impact on a global scale.
2. Classify the important climatic aspects and unravel the mysteries of the past and the myth of the future.
3. Understand and analyse the oceanic processes and the availability of marine resources.

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Paper: DSE 2 Discipline Specific Elective	EVOLUTION OF LIFE THROUGH TIME			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D102

Course Objectives:

The objective of this programme is to understand the various factors responsible for the origin of life and its sustenance and the evolutionary trend of organisms and the controlling factors for the evolution throughout the Geological history.

Course Outcome:

After the completion of course, the students will have ability to:

1. Describe the various factors responsible for the beginning of life on earth and different processes of fossilisation.
2. Illustrate the changes in the parameters of climate through time and its effect on organic evolution.
3. Explain the various geodynamic processes and their effect on distribution and evolution of organisms.

M. Sc. Course in Geology: Semester-II

Paper I Core Course	IGNEOUS AND METAMORPHIC PETROLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164C201

Course Objectives:

The central goal of this paper is to provide understandings on the compositional diversity of magma, magmatic rocks and its relation with the origin of the Earth and its global tectonics. It also furnishes information on the metamorphic processes, textures and structures and its response to changing physical conditions.

Course Outcome:

After the completion of course, the students will be able to:

1. Identify spatial mineral reactions in reconstructing PTt path of metamorphism.
2. Understand the various mineral reactions and their application in geothermobarometry and petrogenetic grid.
3. Apply the principles of phase equilibria in studying igneous systems.
4. Analyse different rocks on the basis of chemical characteristics and comment on their origin.

Paper II Core Course	SEDIMENTOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164C202

Course Objectives:

The objective of the course is to interpret textures and structures of sedimentary rocks; critically analyse the physical and chemical parameters of sedimentary environments and classify them and interpret provenance, sedimentary basins and tectonic control.

Course Outcome:

After the completion of course, the students will have ability to:

1. Understand diagenetic environments and classify the sedimentary rocks genetically.
2. Analyse the processes of deposition of various types of sedimentary rocks.
3. Correlate sedimentation with tectonics and classify sedimentary basins.

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Paper III Core Course	GEOCHEMISTRY AND ISOTOPE GEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164C203

Course Objectives:

The course aims to give an introduction in how chemical principles are used to explain the mechanisms that control the large geological systems such as the Earth's mantle, crust, ocean and atmosphere, and the formation of the solar system. It also will give an overview of theory and applications of stable and radiogenic isotope geochemistry including the use of isotopes.

Course Outcome:

After the completion of course, the students will have ability to:

- Understand the behaviour of elements in a geochemical context, relate this knowledge to how elements redistribute within Earth and learn to interpret and explain interactions between Earth Reservoirs.
- Understand and interpret the major processes that form and modify the Earth's crust and mantle.
- Use isotopes to trace geological processes and age date specific events.

Paper IV Core Course	PRACTICAL II			Subject Code:
	L-T-P-C: 0-0-3-3	Credit Units: 3	Scheme of Evaluation: (P)	GEOL164C214

Course Objectives:

This paper will enable the students to identify the igneous, metamorphic rocks and sedimentary rocks in thin sections and hand specimens and interpret the petrogenesis of these rocks through their textures and structures.

Course Outcome:

After the completion of the course, the students will have ability to:

1. Identify and differentiate between igneous, metamorphic rocks and sedimentary rocks and their textures.
2. Interpret class and origin of the rocks by solving CIPW norms and variation diagrams.
3. Apply and perform mineral formula calculations
4. Solve and evaluate numerical exercises related to X-ray crystallography.

Paper: DSE 3 Discipline Specific Elective	EARTH AND CLIMATE			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D201

Course Objectives:

The objective of the course is to understand the operation of Earth's climate system, interpret role of atmosphere and oceans in Earth's climate and response of biosphere and to get acquainted with orbital cyclicity and variability in climate.

Course Outcome:

After the completion of course, the students will have ability to:

1. Describe Forcing and Response Components of climate system and
2. Explain the heat transfer in ocean and its influence on climate.
3. Analyse and application on the role of stable isotopes in Paleoclimatology.

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Paper: DSE 4 Discipline Specific Elective	QUATERNARY GEOLOGY			Subject Code: GEOL164D202
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The objective of the course is to learn about the earth's surface process and the Quaternary geological history and associated issues of concern like climate change, active tectonics. The course also focuses on various tectonic forcing on climate and the consequent responses, imparts knowledge on the thick repository of Quaternary sediments and their stratigraphic framework in NE India.

Course Outcome:

After the completion of course, the students will have ability to:

1. Describe and explain the various types of chronological methods and data relevant to Quaternary period.
2. Relate and illustrate various forcing agents of the glacial-interglacial cycles and their impact on Quaternary climate.
3. Apply and interpret various techniques to reveal and understand the Quaternary stratigraphy.

M. Sc. Course in Geology: Semester-III

Paper I Core Course	PRINCIPLES OF STRATIGRAPHY AND INDIAN STRATIGRAPHY			Subject Code: GEOL164C301
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: The main objectives of this programme are to understand the basic concepts of stratigraphy and importance of stratigraphic correlation with paleogeographic reconstruction and also on the structure, lithology and stratigraphy of Precambrian, Palaeozoic and Mesozoic Formations of India and detailed stratigraphy of NE India.

Course Outcome: After the completion of course, the students will have ability to:

1. Describe the concepts, techniques, and methodology appropriate for classification and correlation of stratigraphic units.
2. Explain the sedimentary basins of India and analyse basin configurations, sedimentation history and paleoclimate therein.
3. Illustrate and explain the tectono-sedimentary framework and evolution of the sedimentary basins of the Northeast India and classification and correlation of the sedimentary sequences.

Paper II Core Course	PALAEONTOLOGY			Subject Code: GEOL164C302
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: The main objective of the programme is to understand the evolution of life through geological time with respect to climate and tectonic changes. This programme also wants to introduce some major groups of macro and microfossils and their important uses and the study of Gondwana flora of the World and India in context of palaeoclimate and palaeoecology.

Course Outcome: After the completion of course, the students will have ability to:

1. Describe major evolutionary breakthroughs in the evolution of life, major causes of mass-extinction events and some vertebrates based on fossil records in the context of changing pattern of paleoclimate and paleoecology.
2. Explain major invertebrate including microfossil groups and their application in palaeobiological interpretation, hydrocarbon explorations.
3. Explain the process of collecting and analysing fossils, application and significance of palynological studies and analysing the application of Gondwana flora in deciphering paleoclimate of the Permian Period.

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Paper III Core Course	PRACTICAL III			Subject Code:
	L-T-P-C: 0-0-3-3	Credit Units: 3	Scheme of Evaluation: (P)	GEOL164C314

Course Objectives:

The main objective of this practical programme is to identify the different rocks in hand specimens and thin sections from known Indian stratigraphic horizons and to establish the relationships between various facies maps and derive an understanding of paleogeographic reconstruction. This programme also focuses on the identification of different fossils and prepare and interpretation of various hydrogeological maps and sections using remote sensing and GIS.

Course Outcome:

After the completion of course, the students will have ability to:

1. Identify rocks of different stratigraphic horizons of India and locate them in geological maps as well as Prepare and interpret facies maps and perform facies modelling.
2. Identify different invertebrate and plant fossils fossil forms and microscopic study various microfossil groups and analyse biostratigraphic zonation based on foraminiferal fossil assemblages.
3. Prepare and interpret the various hydrogeological maps and sections using remote sensing and GIS and analysis of rainfall data and well hydrographs.

Paper IV Core Course	MINOR PROJECT			Subject Code:
	L-T-P-C: 0-0-4-4	Credit Units: 4	Scheme of Evaluation: (P)	GEOL164C324

Course Objectives: The main objective to include minor project is to generate a pragmatic and research attitude in the students and to make students acquainted with technique of field survey, geological mapping.

Course Outcome: After the completion of course, the students will have ability to:

1. Carry out field survey and geological mapping in an unknown geological terrain.
2. Work in various industrial sites as part of future career prospects
3. Carry out minor remote sensing and GIS based projects related to EIA and/or natural disaster management.

Paper: DSE 1 Discipline Specific Elective	HYDROGEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D301

Course Objectives:

The main objective of this programme is to understand the origin and occurrence of ground water, chemical quality, importance and the factors governing the flow pattern of ground water. This programme also focusses on the relationship between fresh and salt water, performance of aquifer and application of various surface and subsurface investigation for ground water exploration.

Course Outcome:

On completion of the course, the student will have the ability to:

1. Describe the occurrences of groundwater in various geological formations groundwater dynamics, physico-chemical factors governing its quality, its levels and fluctuations.
2. Explain the fluctuations of ground water levels, relate fresh and salt water in the coastal areas, analyse and application of rainfall data and aquifer pumping test data.
3. Illustrate and explain the hydrogeological concepts, exploration, exploitation and recharge of groundwater and also the importance of ground water assessment, development, management and budgeting.

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Paper: DSE 2 Discipline Specific Elective	REMOTE SENSING AND GIS			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D302

Course Objectives:

The ability to collect information over large spatial areas; to characterize natural features or physical objects on the ground; to observe surface areas and objects on a systematic basis and monitor their changes over time; and the ability to integrate this data with other information to aid decision-making.

Course Outcome:

On completion of the course, the student will have the ability to:

1. Explain concepts, methodologies and applications of Remote Sensing technology.
2. Apply spatial data analysis to solve natural, environmental and societal problems and challenges
3. Ability to write and present a substantial technical report/document and publish international level research articles.

Paper: DSE 3 Discipline Specific Elective	RESEARCH METHODOLOGY AND GEOSTATISTICS			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D303

Course Objectives:

The design of the course intends to make the students explore and develop new skills related to research in geo-sciences: research defining problem, research design, data analysis and scientific writing. It also provides systematic structure to data classification and presentation and statistical processing and analysis of geological data.

Course Outcomes:

By the end of this course the students will be able to:

1. Interpret and develop better insight into the theories and philosophy of research.
2. Apply the basic approach in conducting statistical analysis, including the calculation of experimental data, directional analysis (Rose Diagram and variogram surface) and variogram modelling.
3. Evaluate the mathematical and statistical principles behind correlation, regression analysis, variance and covariance, as well as how to apply these geostatistical methods in spatial interpolation based on a set of 2D sampled data.

Paper: DSE 4 Discipline Specific Elective	MARINE GEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D304

Course Objectives:

This course focuses on providing general information about the history, structure and evolution of the ocean floor and its related distribution of sediments. It involves geophysical, geochemical, sedimentological and paleontological investigations of the ocean floor and coastal zone.

Course Outcomes:

By the end of this course the students will be competent enough to:

- Identify the marine sediments and understand its composition and distribution.
- Understand the resources available on the ocean floor and its economic impact on a global scale.
- Decipher the Holocene paleoenvironments based on estuarine and marine core.
- Apply the knowledge of coastal geology in support for coastal management.

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M. Sc. Course in Geology: Semester-IV

Paper I Core Course	FUEL GEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164C401

Course Objectives:

The main objective of this programme is to understand the process of coalification, geographical distribution of Indian coal deposits, nature and origin of petroleum and various rock types related to the petroleum system. This programme also focusses on the migration pattern of petroleum and various Petroliferous basins of India.

Course Outcome:

After the completion of course, the students will have ability to:

1. Understand the evolutionary development of flora, factors related to the coalification process and distribution of Indian coal deposits, analyse coal samples for proximate and ultimate analysis.
2. Illustrate and explain the composition of crude oils, reservoir properties of sedimentary rocks for petroleum deposits and various Petroliferous basins of India.
3. Explain the process of migration of petroleum and the techniques of exploration and geophysical logging and assess their application.

Paper II Core Course	ECONOMIC AND EXPLORATION GEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164C402

Course Objectives:

Purpose of this course is to identify new ore deposits for excavation as well as understanding how ore deposits are generated and localized within Earth's crust. Exploration Geology will let us to know a range of activities that help determine if there are commercially viable mineral resources.

Course outcome:

After the completion of the course, the students will have ability to:

1. Explain different ore formation theories
2. Identify the various exploration techniques
3. Compare the drilling and logging techniques

Paper III Core Course	PRACTICAL IV			Subject Code:
	L-T-P-C: 0-0-3-3	Credit Units: 3	Scheme of Evaluation: (P)	GEOL164C414

Course Objectives:

The main objectives of this practical programme are to identify opaque metallic minerals under ore microscope and study petrography and geochemistry of coal as well as to understand the process of reserve estimation and calculation.

Course Outcome:

After the completion of course, the students will have ability to:

1. Identify and describe the textures and structures of ore minerals under microscope and in hand specimen.
2. Identify the industrial minerals for different mineral-based industries and analyse the proximate analysis in the laboratory.
3. Identify macerals in polished pellets of coal and prepare structure contour and isopach maps.

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Paper IVCore Course	MAJOR PROJECT			Subject Code:
	L-T-P-C: 0-0-4-4	Credit Units: 4	Scheme of Evaluation: (P)	GEOL164C424

Course Objectives:

The main objective to include minor project is to generate a pragmatic and research attitude in the studentsand to make students acquainted with technique of field survey, geological mapping.

Course Outcome:

After the completion of course, the students will have ability to:

1. Formulate a research problem from a geological terrain and prepare a model to address it with detailed laboratory analyses.
2. Apply the remote sensing and GIS tools for various environmental and geological studies.

Paper: DSE 5 Discipline Specific Elective	ENGINEERING GEOLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D401

Course Objectives:

The objective of this course is to provide skills in geological investigation for an engineering structure along with possible mitigations for the geological effect. This course also provides geological and geotechnical recommendations, analysis, and design associated with human development and various types of civil structural construction.

Course Outcomes:

After the completion of course, the students will have ability to:

1. Understand the different soil and rock properties that are necessary to analyse before any Mega constructions.
2. Explain the required Geotechnical considerations of Mega structures.
3. Illustrate and explain the importance of Disaster Management along with different environmental impacts.

Paper: DSE 6 Discipline Specific Elective	ENVIRONMENTAL GEOLOGY, MAPPING AND SURVEYING			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEOL164D402

Course Objectives:

For a solid understanding of not only currently occurring geologic events, yet chronicled geologic occasions, for example, past quakes and floods. This information on the past is significant in light of the fact that it encourages them to show signs of improvement thought of what kinds of geologic occasions rehash themselves, with what recurrence they may happen, and what sorts of harm happened in view of those occasions.

Course Outcome:

After the completion of the course, the students will have ability to:

1) Able to know the basic earth science as applied to the interaction between human activity and natural environment.
2) Explain how earth processes create hazards to life and property.
3) Describe the major sources of water, soil, and sediment pollution and methods for their management.

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Paper: DSE 7 Discipline Specific Elective	BASIN ANALYSIS			Subject Code: GEOL164D403
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The main objectives of this programme are to understand the sedimentary basins, geodynamic entities, surface and subsurface methods employed for characterizing a sedimentary basin as well as application of sequence stratigraphy in drawing tectonic and sedimentation history of a sedimentary basin and its petroleum potential.

Course Outcomes:

After the completion of course, the students will have ability to:

1) Understand and describe the sedimentary basins, geodynamic entities as well as compositional and rheological zonation of the earth.
2) Analyse the role of plate tectonics in formation of a sedimentary basin and functioning of sedimentary routing systems.
3) Establishment of stratigraphy and thermal history of a sedimentary basin and correlate stratigraphical columns based on lithological, heavy mineral assemblage and paleontological data as well as interpret and correlate geophysical logs in terms of petroleum exploration.

Paper: DSE 8 Discipline Specific Elective	GEOPHYSICAL EXPLORATION AND SEISMOLOGY			Subject Code: GEOL164D404
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The main objectives of this programme are to understand the techniques of gravimetric and magnetic surveys and their applications in mineral explorations and correlate spatial distribution of earthquakes in the light of plate tectonics as well as interpret seismic waves and crustal velocity structures.

Course Outcomes:

After the completion of course, the students will have ability to:

1) Describe the principles and procedures of different exploration techniques. Interpret seismic, gravity, magnetic data and paleoseismological data.
2) Analyse the data generated from different exploration methods and identify anomalies and delineate discontinuities.
3) Prepare and interpret geophysical maps of a given area and identify seismic waves in seismograms during pre-, syn- and post-seismic activities.

Anuradha Deb.

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ROYAL GLOBAL UNIVERSITY

GUWAHATI

ROYAL SCHOOL OF BIO - SCIENCES

(RSBSC)

DEPARTMENT OF MICROBIOLOGY

COURSE STRUCTURE

&

SYLLABUS

M.Sc. Microbiology

Year- 2022-23

The Assam Royal Global University IQAC Estd. 2016

Anuradha Devi

Director, IQAC
The Assam Royal Global University

SYLLABUS (1ST SEMESTER)

Paper I: General Microbiology		Subject code: MIB154C101
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

The course is developed with the following objectives:

- To enable the students to develop a historical perspective of the subject of microbiology
- To understand the fundamental principles of microbiology like Koch's postulates
- To explain the scientific organization of microbial organisms into taxons and introduce to the students, the major system of microbial classification
- To enable understanding of the general and ultra-structural organization of the bacterial cell
- To impart the basic skills for the culture of microbes

Course Outcome:

- CO-1: Remember the basic concepts of General Microbiology and History.
- CO-2: Understanding of media preparation, sterilization techniques, and cultivation of microbes.
- CO-3: apply the knowledge of microbiology techniques and concepts in research.
- CO-4: Analysis of the problem associated with microbes in humans, animals, and plants.
- CO-5: Evaluate their understanding of expanding their future prospect for pursuing an entrepreneurial venture

Paper II: Phycology, Mycology and Virology		Subject code: MIB154C102
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

- This course introduces the basic features of algae, fungi and their importance.
- The contents are also designed to help students understand about their habitat and the reproduction of these organisms.
- Further, the course also provides a detailed study of viruses, virusoids, and prions.

Course Outcome:

- CO-1: Memorize the basic concepts of Algae, Fungi, and viruses.
- CO-2:Understanding of the diversity, distribution, cell structure, life cycles and economic importance of both algae and fungi.
- CO-3: Demonstrate knowledge of microbiology techniques and concepts in phycology and mycology and virology research.
- CO-4: to categorize the problem and disease associated with fungus and virus in human, animals and plants.
- CO-5: Conclude their future prospect for pursuing an entrepreneurial venture.

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Paper III: Microbial Genetics		Subject code: MIB154C103
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

- This course is design to make the students understand the concept of genetics and the principles underlying the processes which control the expression of the genes in prokaryotes and also design to understand the mechanism involve in the transfer of different genes among inter and intra species that leads to change in phenotype.

Course Outcome:

- CO-1: Memorize the basic concepts of DNA and Genetic material.
- CO-2: Understanding of DNA structure, chromosome organization in microbes.
- CO-3: apply the knowledge of DNA and chromosome in genetic issue detection in human and plant.
- CO-4:Analysis of the genetic disease associated with microbes in humans, animals, and plants.
- CO-5:Determine the future prospect to cure genetic disorder .

SYLLABUS (2nd SEMESTER)

Paper I: Immunology	Subject code: MIB154C201	
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

- This course is designed to provide knowledge about the immune response in the body along with the basic structure of antigens and antibodies. Further, the syllabus also includes the application of antigens and antibodies in the different serological tests.

Course Outcome:

- CO-1: Remember the basic concepts about the innate and adaptive immune system.
- CO-2: Understanding of the antigen, antibody structure, and working mechanism of the Immune system.
- CO-3: apply the knowledge of antigen, antibody, RIA and other techniques in HLA typing and related research.
- CO-4:Analysis of autoimmune disease and other related issues.
- CO-5:Determine the future prospect to solve immunity-related issues.

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Paper II: Molecular biology and Recombinant DNA technology		Subject code: MIB154C202
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

- This course provides detail information regarding nucleic acid, DNA replication, transcription, and translation. The course also discusses details about different cloning vectors.

Course outcome:

- CO-1: Remember the basic concept of genome organization and omics approaches.
- CO-2: Understanding of the replication, Transcription, and mechanism in the cell.
- CO-3: apply the knowledge of genome organization in mutation and virulence gene study.
- CO-4:Analysis of genetic material to correlate gene mutation and its impact on function.
- CO-5:Determine the future prospect to solve genetic disorders.

Paper III: Applied microbiology and Enzyme technology		Subject code: MIB154C203
L-T-P-C-4-0-0-4	Credit units: 4	Scheme of evaluation: (T)

Course Objective:

- The course is designed to give an idea about the diversity of microbes and their identification.
- The syllabus is also design to understand the role of microbe in waste treatments especially degradation of xenobiotics compound. Further the course is design to give the basic idea about the microbial biotechnology and the application of different microbes in the industries.
- The course is also designed to allow students to understand about different microbial enzymes produce by microbes, their purification technique and its application in different fields. Further, students will also learn about the products (antibiotics, biofuel etc.) that can be produced from microbes.

Course outcome:

- CO-1: Remember the basic concept of microbiology related to the application in various fields.
- CO-2: Understanding the synthesis mechanism of Biopolymers and bioplastics, Bioprocess technology, beer, wing etc.
- CO-3: apply the knowledge of microbes to produce enzymes at a commercial scale.
- CO-4: Analysis of microbial potential for the benefit of society, environment, and industries.
- CO-5: Determine the future prospect to solve issues related to mankind and the environment.

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SYLLABUS (3rd SEMESTER)

Paper I: Parasitology, Medical and Veterinary Microbiology		Subject code: MIB154C301
L-T-P-C-3-0-0-3	Credit units: 4	Scheme of evaluation: (TP)

Course Objective:

The course is developed with the following objectives:

- To enable the students, to develop a proper understanding of different pathogenic microbes.
- To understand the mode of transmission and life cycle of human and animal pathogens.
- To enable understanding of the mode of action of anti-microbial agents.
- To impart the basic skills for the diagnosis and identification of pathogenic microbes.

Course outcome:

- CO-1: Remember the basic concept of pathogenesis and transmission and life cycle.
- CO-2: Understanding of normal microflora of human body; role of resident flora. Host-parasite relationships, Infection type.
- CO-3: apply the knowledge of antimicrobial agents and antibiotics as chemotherapeutic agents.
- CO-4: Analysis of the Emerging communicable diseases (Plague, Anthrax) and their control.
- CO-5: Determine the future prospect of different therapeutic agents.

SYLLABUS (3rdSEMESTER)

Paper II: Food Microbiology		Subject code: MIB154C302
L-T-P-C-3-0-0-3	Credit units: 4	Scheme of evaluation: (TP)

Course Objective:

The course is developed with the following objectives:

- To enable the students to develop a proper understanding of different food-born microbes.
- To understand the principles of food preservation.
- To enable understanding of food born infection and intoxication.
- To impart the basic skills for laboratory testing and quality control of food.

Course outcome:

- CO-1: Remember the Micro-organisms and their importance in food microbiology – molds, yeast, bacteria.
- CO-2: Understanding of the organisms, and different factors those influence microbial growth in food.
- CO-3: apply the knowledge of microbes in Food fermentation – Bread, vinegar, fermented vegetables, fermented dairy products.
- CO-4: Analysis of the microbial potential for fermentation and product development.
- CO-5: Evaluate their understanding of expanding their future prospect for pursuing an entrepreneurial venture

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SYLLABUS (4th SEMESTER)

Paper I: Soil and Environmental Microbiology		Subject code: MIB154C401
L-T-P-C-3-0-0-3	Credit units: 4	Scheme of evaluation: (TP)

Course Objective:

The course is developed with the following objectives:

- To enable the students to develop a proper understanding of soil and environment microbes.
- To understand the role of microbes in the environment.
- To enable understanding of the application of microbes such as a biofertilizer
- To impart the basic knowledge of environmental microbes and their application.

Course outcome:

- CO-1: Remember the agriculturally important and environment-friendly microbe.
- CO-2: Understanding of various soil types, Rhizosphere, and rhizoplane. Nitrogen fixation: A symbiotic and symbiotic nitrogen fixation system.
- CO-3: apply the knowledge for the Production of biofertilizers and biopesticides
- CO-4: Analysis of the role of microbes in terrestrial and aquatic ecosystems.
- CO-5:Determine the future prospect of different microbial consortia for agriculture and environmental issue.

SYLLABUS (4th SEMESTER)

Paper II: Industrial Microbiology and Fermentation Technology		Subject code: MIB154C402
L-T-P-C-3-0-0-3	Credit units: 4	Scheme of evaluation: (TP)

Course Objective:

The course is developed with the following objectives:

- To enable the students, to develop a proper understanding of industrially useful microbes.
- To understand the suitability of microbes and their economic aspect.
- To enable understanding of the growth kinetics and fermentation technology.
- To impart the basic skills for batch culture, fermentation, and secondary metabolite processing.

Course outcome:

- CO-1: Remember the basic concept of the suitability of microbes in industrial processes and their source types.
- CO-2: Understanding of Batch culture in fermentation, growth kinetics of micro-organisms
- CO-3: apply the knowledge for Continuous culture and scale-up –productivity and product formation.
- CO-4: Analysis of the selection, improvement, and maintenance of industrial important strain.
- CO-5: Determine the future prospect of microbial product development at the commercial level.

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Elective: DSE 1 (Discipline specific)- Semester -1st

DSE Paper : Microbial biochemistry **Subject code: MIB154D101**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

This course focuses on the concepts of biochemistry and important microbial macromolecules and their role in metabolism. On completion of the course a student will be well versed with the knowledge of different metabolic pathways in bacteria and eukaryotes.

Course outcome:

- CO-1: Remember the basic information about the Chemistry of Life and biomolecules.
- CO-2: Understanding the structure of biomolecules such as proteins, enzymes, lipids etc.
- CO-3: apply the knowledge for the synthesis and application of biomolecules in industries and the agriculture sector
- CO-4: Analysis of the role of the different biomolecules to maintain crucial life functions.
- CO-5: Determine the future prospect of synthesis of biomolecules at the commercial level.

Elective: DSE 2 (Discipline specific)- Semester -2nd

DSE: Microbial diseases and its Diagnosis **Subject code: MIB154D201**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

This course is design with an objective to provide the basic information related to bacterial, viral, fungal and protozoan diseases and their diagnosis. Further, this course also provides up to date information regarding different serological and molecular based methods to detect the pathogens involve in causing disease

Course outcome:

- CO-1: Remember the basic information about Bacterial, Viral, Fungal, and Protozoan Diseases.
- CO-2: Understanding the Method of collecting clinical samples and precautions required
- CO-3: Apply the knowledge for disease diagnosis as well as an understanding of its severity.
- CO-4: Analysis of the association of pathogen and environmental factors in disease development.
- CO-5: Determine the development of a kit for the quick detection of pathogens.

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Elective: DSE 3 (Discipline specific)- Semester -3rd

DSE: Bioinstrumentation and computational biology **Subject code: MIB154D301**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

The course is developed with the following objectives: To enable the students to develop a proper understanding of different instruments used in microbiological and molecular research. Further, this course will also introduce students to the rapidly evolving field of bioinformatics and biostatistics.

Course outcome:

- CO-1: Remember the basic concept of various biotechniques.
- CO-2: Understanding the working principles of biotechniques and data analysis.
- CO-3: Apply the techniques for a better understanding of life functions.
- CO-4: Analysis of the structure of the protein, DNA, RNA, and other related functions.
- CO-5: Determine the scope of testing lab development for clinical and nonclinical research.

Elective: DSE 4 (Discipline specific)- Semester -3rd

DSE: Antibiotic resistance in bacteria **Subject code: MIB154D302**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

L-T-P-C-3-0-0-3 **Credit units: 3** **Scheme of evaluation: (T/P/TP)**

Course Objective:

This course is designed with the objective to provide students about different antibiotic agents used in healthcare along with their mode of action. This course also includes the mechanisms bacteria use to develop antimicrobial resistance and the factors that can lead to it. The course also designs to acquaint students with the effects of multidrug-resistant organisms in hospitals and different prevention and control strategies.

Course outcome:

- CO-1: Remember the basic concept of antibiotics.
- CO-2: Understanding the working principles of antibiotics.
- CO-3: Apply the techniques for a better understanding of antibiotic resistance development.
- CO-4: Analysis of the mechanism of resistance development against multiple antibiotics.
- CO-5: Determine the scope of alternatives of antibiotics for MDR.

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Elective: DSE 5 (Discipline specific)- Semester -3rd

DSE: Inheritance Biology **Subject code: MIB154D303**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

The course is developed with an objective to understand the fundamental principles of Mendelian inheritance, including multiple allelism, lethal alleles, gene interactions, and sex-linked transmission. The course is also designed to enable the students to apply the principles of inheritance as formulated by Mendel and understand basic aspects of the flow of genetic information from DNA to proteins. Further, this course will enable students to understand the structure and its functional role in encoding genetic material.

Course outcome:

- CO-1: Remember the basic concept of genetics.
- CO-2: Understanding the transmission of character from one generation to the next generation.
- CO-3: Apply the mendelian law and another concept to recognize the genetic disorder
- CO-4: Analysis Patterns of inheritance of character generation to generation
- CO-5: Determine the scope to fix the genetic disoder.

Elective: DSE 6 (Discipline specific)- Semester -4th

DSE: Plant-microbe interaction and plant disease **Subject code: MIB154D302**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

The course is developed with the following objectives: To enable the students to develop a proper understanding of the interaction taking place among the microorganism along with another organism. This course also includes the microbes present in the soil environment and their impacts on different plants. Further, this course also includes about the plant pathogens and the social impact of plant diseases.

Course outcome:

- CO-1: Remember the basic concept of Plant -Microbe Interaction.
- CO-2: Understanding the Rhizosphere effect; Phyllosphere effect; Spermosphere effect .PTI. ETI.
- CO-3: Apply the plant-microbe interaction for better plant health.
- CO-4: Analysis of symptom and disease development in plant
- CO-5: Determine the scope of PMI for plant health and development..

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Elective: DSE 7 (Discipline specific)- Semester -4th

DSE: Microbes in extreme environment **Subject code: MIB154D402**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

Extreme environments are numerous and diverse on Earth. Despite harsh environmental conditions, microbes have been found thriving from the deepest seafloors to the highest mountains, from the coldest polar regions to the hottest and most arid deserts or steaming hot springs. The course will encompass foundational material for the study of life in extreme environments. In this course, we will examine microbial adaptations to their environment, how the adaptive responses affect microorganisms' evolution and how microorganisms modify their environment. We will consider physical extremes, such as temperature, pH, salinity and radiation. Additionally, we will explore the wide application potential of this area of research in the fields of medicine, biotechnology, chemical and pharmaceutical industry, or cosmetics.

Course outcome:

- CO-1: Remember the basic concept of microbial diversity.
- CO-2: Understanding the adaptations: thermophiles, psychrophiles, halophiles, acidophiles, alkaliphile.
- CO-3: Apply the microbe to reduce metal toxicity and another issue.
- CO-4: Analysis of microbe potential to solve environmental problems.
- CO-5: Determine the scope of microbe to develop product at commercial level.

Elective: DSE 8 (Discipline specific)- Semester -4th

DSE: Metagenomics **Subject code: MIB154D403**

L-T-P-C-4-0-0-4 **Credit units: 4** **Scheme of evaluation: (T)**

Course Objective:

This course is designed to provide some basic idea about non culturable microorganism, whole genome sequencing and their study through the metagenomics approach.

Course outcome:

- CO-1: Remember the basic concept of metagenomics.
- CO-2: Understanding the metagenomics approach to identify microbes in the environment.
- CO-3: Apply the metagenomics approach to screen beneficial microbes.
- CO-4: Analysis of microbe potential to improve humans, Plant health and environmental problems.
- CO-5: Determine the scope of nonculturable microbes to develop products at the commercial level

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Department of History

SYLLABUS

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COURSE STRUCTURE

M. A. in History-102 Credits

The Assam Royal Global University IQAC Estd 2018

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MA Semester I

Paper Name: Economic and Socio-Cultural History of Ancient India
Subject Code: HST184C101 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- 1. To provide a detailedknowledge and to appreciate the rich history and heritage of India. 2. To understand the complexities of the traditional Indian social system. 3. To have a clear idea of the urbanisation process of a predominantly agricultural India. 4. To understand the pluralism of Indian society	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Detailed knowledge of the rich history and heritage of India in its first phase enables one to go to the root and solve issues accordingly. 2. It will inculcate ideas of national identity. 3. Will provide a fillip to Heritage Conservation	1. Semester end examination: 70 marks 2. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

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MA Semester I

Paper Name: Methods, Archives and History
Subject Code: HST184C103 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- 1. To introduce students to important issues related to the subject matter of history, historical facts. 2. To acquaint students with quantitative methods, philosophy of history, and the problem of historicalobjectivity. 3. To introduce students to the ways in which the past is narrated, recorded, and remembered. 4. To get students acquainted to the issues of how historical evidence is produced, and relationship of history that emerges from written documents with other forms ofsocial memory.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The students will- 1. Develop an understanding of the concepts of ontology, epistemology, and scepticism in history. 2. To study the significance of facts, methodologies and techniques involved in history writing. 3. Introducing the importance of philosophy, objectivity and ethics in history. 4. Develop an understanding of the archive, and its importance in history. 5. Introducing the students with the fundamental aspects of research and writing like referencing, citation, use of sources etc.	1. Semester end examination: 70 marks. 2. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

MA Semester I

Paper Name: Beginning of Human Civilization: Ancient Mesopotamia
Subject Code: HST184C104 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1.To acquaint students with some of the major themes related to the ancient civilisation of Mesopotamia, like its political history, social institutions, and religious and cultural practices.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. It will help to bring about an understanding of the agrarian revolution and changes in pre-historic Mesopotamia. 2. Understand the process of urbanisation and social stratification in Mesopotamia. 3. To understand the interplay of power, ideology and their representation in Mesopotamia.	1. Semester end examination: 70 marks. 2. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

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MA Semester II

Paper Name: State Formations in Medieval India: Polity and Administration
Subject Code: HST184C201 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the coursare- • To introduc students to the variegate political formations an state systems of medieva India. • To acquainstudents with the debatethat surround statformation in the Indiasubcontinent during th period from 10th to 18 century CE.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: • Get introduced to aspects of medieval Indian political systems. • Get acquainted with different kingdoms, their administration and state structures.	1. Semester end examination: 70 marks B 2. Internal Assessment:30 marks (Assignment: 10, Assignment Presentation: 05, ClassParticipation: 05; Mid-semester 10)

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MA Semester II

Paper Name: Culture, Imperialism and Knowledge: Europe and the World, 1500-1900
Subject Code: HST184C202 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of thecourse are- • To provide a comparative view of European colonialism from approximately 1500 to 1900. • To acquaintstudents with European forms of knowledge and European attempts t imperatives, the societiesthat they colonized.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: • Gain an understanding of cultural constructs like Orientalism and its cultural implications on colonialism. • The student will have a deeper understanding of the idcological roots of Colonialism and Imperialism of Europe.	A. Semester end examination:70 marks B B. Internal Assessment:30 marks (Assignment: 10,Assignment Presentation:05, Class Participation: 05;Mid-semester 10)

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MA Semester II

Paper Name: Gender in History
Subject Code: HST184C203 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • To introduce students to the broad debates and theoretical formulations around sexuality, nationalism, race, history and their relationship to gender. • Focus on select case studies from across the globe and explore their gendered nature, while attempting to draw their broader linkages to the theoretical formulations. • Focus equally on the Indian scenario, both in pre andpost independent India.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: Gain an understanding of important issues related to sexuality, gender and their underlying connections to race and nationalism. Become acquainted with different theoretical frameworks of feminism and gender. Develop an understanding of the issues and prospects offndian feminism.	A. Semesterend examination:70 marks B B. Internal Assessment:30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05;Mid-semester 10)

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MA Semester II

Paper Name: History of Eighteenth Century India
Subject Code: HST184C204 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • To acquaint students with the events following the decline of the Mughal Empire, till the rise ofthe British Empire • It will also focus on the regional kingdoms and trace their evolution and gradual rise to power. Furthermore, it will introduce students with the historiographical debates of the eighteenth century.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: • Gain an understanding of the socio-political and cultural ideas of pre-modern India • Become acquainted with the historiographical debates and issues of eighteenth-century India.	A. Semester end examination : 70 marks B. Internal Assessment:30 marks (Assignment:10, Assignment Presentation: 05, Class Participation:05; Mid-semester10)

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MA Semester III

Paper Name: Historical Archaeology in Comparative Perspective
Subject Code: HST184C301 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar –20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • To introduce students to the relationship between history and archaeology. • To acquaint students with historical archaeology of the ancient, medieval and early modern world, including India, through case studies. • To promote the study and use of historical archaeology in order to corroborate other historical sources.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: 1. Develop an understanding of the upcoming trends in the discipline. 2. Gain a thorough knowledge of the socio-economic, cultural and political developments in India, including Assam, in relation to the outside world. 3. Also gain a thorough knowledge of the early modern period in respect of conquest and colonisation through the lenses of archaeology.	A. Semester end examination: 70 marks B B. Internal Assessment:30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05; Mid-semester 10)

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MA Semester III

Paper Name: History, Culture and Politics in North East India

Subject Code: HST184C302 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%

End term examination: 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • This paper is an interdisciplinary survey of North East India that covers various aspects of medieval, colonial and post-colonial history, society and culture of the region. • It will also be attempted to acquaint the students with the concepts of modernity and colonial modernity, the arrival of the missionaries, coming of the print, educational initiatives and growth ofthe public sphere. • To introduce the students with the impact of colonial policies relating to land, forests and ecology of the Northeastern region. • To introduce the students with issues of politics of identity and electoral politicsin the Northeastern region.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. The students will develop an understanding of the socio-cultural and geo-political issues of North East India. 2. The students will be acquainted with the issues of land, ecology, economy and identity in the pre and post independent period.	A. Semester end examination: 70marks B. Internal Assessment:30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05; Mid-semester 10)

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MA Semester IV

Paper Name: Select Issues in the Study of Nationalism in India, 1919-49

Subject Code: HST184C401 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar –20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. The course offers a study of selected issues in the study of mass nationalism. 2. It shall focus on varying facets of Gandhian nationalism andentail an in- depth engagement withprimary source materials.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Develop an understanding of the sources and various interpretations of the Indian National Movement from 1919. 2. To understand the strategies and instruments of the movement. 3. To understand changes in society, culture and polity as a result of the movement.	1. Semester end examination: 70 marks 2. Internal Assessment:30 marks (Mid-Semester exam:10,Assignment: 10, Assignment Presentation: 05, Class Participation: 05)

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MA Semester IV

Paper Name: Approaches to Global History 1492-2001

Subject Code: HST184C402 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • to acquaint students with the forces that shaped the contemporary world from the vantage point of global history. • To trace the history of globalization while focussing upon the processes that were set in motion by the discovery of the New World in 1492.	1. Lecture Method A. Assignment B. Individual and Group Presentation	The student will: • students will be equipped with knowledge of how larger socio-political forces have shaped history and how history writing itself has represented these forces. • Furthermore, students will be also be equipped with historiographical trends and ways.	A. Semester end examination: 70 marks B. Internal Assessment: 30 marks (Mid-Semester exam:10,Assignment: 10, Assignment Presentation: 05, Class Participation: 05)

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MA Semester I (DSE)

DSE Paper Name: Gender and Women in Ancient Societies

Subject Code: HST184D101 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce students to the concept of 'gender'. 2. To acquaint students withimportant historiographical interventions	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. This course will cover a long chronological span from the pre-historic to the historical period. It will deal with some representative ancient societies of Europe and Asia. 2. The focus of the course will be on the gender analysis of the socio-political and religious setup.	1. Semester end examination: 70 marks. 2. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

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MA Semester II (DSE)

DSE Paper Name: Innovations in Medieval India: Tools, Techniques, Technologies andCulture
Subject Code: HST184D202 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce students to important issues related to Medieval Indian History and the technological innovationsof the period 2. To provide a	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Students will understand the changes brought about in the culture and society through the technological innovations in medieval India.	1. Semester end examination: 70 marks 2. Internal Assessment:20 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05

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MA Semester III(DSE)

DSE Paper Name: Colonialism and Law in British India

Subject Code: HST184D301 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• This course will introduce the students with the legal history of British India. • To acquaint students with historical approaches to study law and society in British India. • To acquaint students with comprehensive ideas of law making, administrative and legal enterprises and introduction of the new legal regime with associate institutions and structures.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. This course will familiarise the students with the formation of the colonial legal regime and the making of the colonial legal subject in South Asia under British rule. 2. The course will also allow the students to analyse the relationship between imperial law and the process of colonialism, colonial law and colonial violence, law and exception and so on.	A. Semester end examination :70 marks B. Internal Assessment:30 marks (Assignment: 10, Assignment Presentation: 05,Class Participation:05; Mid-semester10)

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M.A Semester III (DSE)

DSE Paper Name: Politics, Society and Culture in Medieval Deccan
Subject Code: HST184D302 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce students to the historical developments in the Deccan. 2. To acquaint students with not only the political but also the social and cultural history of Medieval Deccan.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. The students will have an understanding of the political and cultural history of medieval Deccan from the early fourteenth century when the Bahmani Sultanate emerged to the end of the seventeenth century; when the region was virtually incorporated into the Mughal empire.	A. Semester end examination: 70 marks B B. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05; Mid Semester Exam 10)

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DSE Paper Name: Indian National Movement: Early Phase (1885-1919)
Subject Code: HST184D303 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• To introduce students with the emergence of nationalism in India and the factors responsible for the emergence of nationalism. • This paper will also provide a deep understanding of the major developments in the Indian freedom movement in the pre-Gandhian era.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: 1. Develop an understanding of the historiography of the Indian national movement, especially during the early phase of the freedom movement. 2. They will also gain an understanding of the important issues related to the formation of the Indian National Congress and its different trends in its leadership. 3. Will be acquainted with the political developments in India during and after the Swadeshi Movement.	A. Semester end examination: 70 marks B. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05; Mid Semester Exam 10)

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MA Semester III (DSE)

DSE Paper Name: Agrarian Protests and Movements in India 1830-1951

Subject Code: HST184D309 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
The objectives of the course are- • To introduce students to the variegated movements in rural India during the colonial and post-colonial times. • It attempts to acquaint students to the trajectories of rural mobility, action and representation on the sub-continent. • The paper will also familiarise the students with the various ideologies that have fuelled the organisation of movements.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	The student will: • Become awareof the forms of organisations, mobilisation and action in rural India in the colonial period. • Get acquainted with the various ideologies that propelled movements in rural India.	A. Semester end examination: 70 marks B. Internal Assessment:30 marks (Mid-Semester exam:10, Assignment: 10, Assignment Presentation: 05, Class Participation: 05)

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MA Semester IV (DSE)

DSE Paper Name: Language, History and Nationalism in South Asia

Subject Code: HST184D408 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Attendance, Class Tests, Quizzes, Seminar – 20%
- **Mid-term examination:** 10%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
This course will examine the relationship between language, culture and politics in South Asian history. The main themes will include the following: 1. Relationship between language, culture and power in pre-modern India. 2. Colonial knowledge production and language. 3. The role of language in shaping national and regional imaginations in colonial and post-colonial India 4. Emergence of linguistic publics and counter-publics defined through print, literary genres, cultural and political rhetoric, etc.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Will develop an understanding of the sources and various interpretations of language and cultural nationalism. 2. Will understand the strategies and instruments of such nationalism. 3. Will understand changes in society, culture and polity as a result of such forms of nationalism.	A. Semester end examination: 70 marks B. Internal Assessment: 30 marks (Mid-Semester exam:10, Assignment: 10, Assignment Presentation: 05, Class Participation: 05)

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MA Semester IV (DSE)

Paper I: Western Political Thought
Subject Code: HST184D404 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce students to important issues related to Western Political Thought by giving them a broad overview of significant philosophical traditions. 2. To acquaint students with important thinkers covering the major epochs in the history of humankind	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Develop an understanding of the nature, characteristics, approaches and strategies of Political Thought. 2. To understand the evolution of the political traditions from the Greek city-states to the Renaissance period in Europe. 3. To understand changes in Political Thought in the post-enlightenment period with the advent of colonialism, republicanism and popular movements from late eighteenth century onwards.	1. Semester end examination: 70 marks 2. Internal Assessment:30marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

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MA Semester IV (DSE)

Paper I: Indian Political Thought
Subject Code: HST184D410 **Credit Units: (L-T-P-C): 3-1-0-4**

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To introduce students to important issues related to Indian Political Thought by giving them a broad overview of significant philosophical traditions. 2. To acquaint students with important Indian political thinkers and issues related to social evolution and statecraft.	1. Lecture Method 2. Assignment 3. Individual and Group Presentation	1. Develop an understanding of the nature, characteristics, approaches and strategies of Indian Political Thought. 2. To understand the evolution of the political traditions during the Indian Freedom Struggle. 3. To understand the contribution of socio-religious and socialist thinkers in the development of Indian polity in the post-independent period.	1. Semester end examination: 70 marks 2. Internal Assessment: 30 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05, Mid-semester examination: 10).

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Royal School of Environmental & Earth Sciences

(RSEES)

Department of Environmental Science

Learning Outcomes based Curriculum Framework (LOCF)

For Postgraduate Programme

M.Sc. Environmental Science

w.e.f. 2022-23

M. Sc. Course in Environmental Science: Semester-I

Anuradha Dev.

Director, IQAC
The Assam Royal Global University

Paper I Core Course	Fundamentals of Environmental Science	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	ENV164C101

Course Objectives:

The paper will provide the students with fundamental concept of different segments of environment and knowledge related to different types of natural resources, biodiversity and its conservation and population growth and its impact on environment.

Course Outcome:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define principles of environmental science and concept of structure and function of different compartments of the Environment	1
CO2	Illustrate the mechanisms of interactions between different spheres of environment	2
CO3	Develop scientific perspective of the issues confronting our present-day environment	3
CO4	Analyze the national and global environmental issues relating to atmosphere, water, soil and land use, biodiversity, and natural resources	4

Paper II Core Course	Environmental Chemistry and Toxicology	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	ENV164C102

Course Objectives:

The paper will provide the students with the knowledge of important chemical reactions in air, water and soil, and the reactions associated with smog formation, ozone and acid rain chemistry. The objective is also to inculcate the pesticide and heavy metal chemistry and their transport mechanism in the food chain.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define the concepts, principles, and methods of environmental chemistry and environmental toxicology	1
CO2	Compare and demonstrate different techniques used for analysis of hazardous substances	2
CO3	Identify and examine the movement of toxicants in both biotic and abiotic components of the environment	3, 4

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Paper III Core Course	Environmental Biology and Ecology			Subject Code: ENV164C103
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

To impart knowledge on population ecology (flora and fauna), their physiological and morphological traits so as to make the students understand the mode of action of pollutants on plant and animal system.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Relate how both plants and animals respond to pollutants and their tolerance mechanism	1
CO2	Demonstrate comprehensive understanding of the pollution damage to flora and fauna	2
CO3	Apply and inspect the different control measures and environmental techniques for the remediation of environmental pollution	3, 4
CO4	Propose some ecofriendly and traditional techniques for the remediation/reclamation of degraded environment	5

Paper IV Core Course	Practical-I			Subject Code: ENV164C114
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	

Course Objectives:

The practical paper will provide an understanding on different analytical techniques for the analysis of soil and water physical parameters. It will also provide hands on training on experiments such as turbidimetric and potentiometric that will help develop expertise on analysis of various environmental samples and sampling techniques.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Identify different analytical techniques of physico-chemical parameters of soil and water	3
CO2	Distinguish and evaluate different tests to understand the validation of the techniques for soil and water	4, 5
CO3	Develop skills to create awareness to the community at the regional level on the impact of soil and water pollution	6

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Paper I DSE	Climatology and Meteorology L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: ENV164D101

Course Objectives:

The paper aims to provide an understanding of the earth's climate and the factors responsible for its change. It will focus on the physical principles governing the global energy budget, the role of the circulation of the atmosphere and oceans, and interactions between different components of the climate system. Also, it will provide insights about the climate variability that results from interactions within the climate system (e.g., El Nino-Southern Oscillation (ENSO).

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and demonstrate sound understanding of the atmosphere and climate as integral part of the physical environment	1, 2
CO2	Utilize and explain meteorological knowledge in the matrices of environmental research	3
CO3	Examine the interaction between earth and atmospheric system, and explain their mechanisms particularly the microclimate	4, 5

Paper 2 DSE	Environmental Economics L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: ENV164D102

Course Objectives:

To impart the basic and key knowledge of scope and importance of ecological economics. This will help in enhancing the knowledge of cost & benefit analysis, economics in sustainability, global sustainability and economic solutions to environmental problems.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and explain the concept of sustainability from economic and environmental frontage	1, 2
CO2	Identify the fundamentals of environmental economics and examine its application on human welfare	3, 4
CO3	Prioritize the best environmental regulation practices gained through case studies	5

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M. Sc. Course in Environmental Science: Semester-II

Paper I Core Course	Statistical methods in Environmental Application			Subject Code: ENV164C201
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

This paper will introduce the basic concepts useful for environmental data analysis. It will help the students to be aware of a wide range of statistical applications in environmental management and decision making so that they can develop technical skills to use statistical tools and software for real time environmental data analysis.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understanding on concept of population and sample in environmental statistics (descriptive and analytical)	1, 2
CO2	Apply one or more of the standard statistical software (Microsoft excel, SPSS, R, Minitab, etc.)	3
CO3	Apply the knowledge on probability and other forms of distributions (Normal, Poisson etc.) for data-analysis and evaluation	3, 4, 5

Paper II Core Course	Environmental Pollution and Control			Subject Code: ENV164C202
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives

To impart the knowledge of pollution and environmental degradation so that the students acquire a set of values for environmental protection. This paper also aims at providing the students with the knowledge on various environmental policies and guidelines related to environmental pollution and its control.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define the different sources of environmental pollution and demonstrate various remedial/control measures	1, 2
CO2	Identify the magnitude and intensity of environmental pollution and relate with real-time ground problems	3
CO3	Analyze different types of pollution and the guidelines for their control in the context of public health	4
CO4	Undertake environmental sampling and estimate data with respect to air, soil, water and noise pollution	5

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Paper III Core Course	Natural Hazards and Disaster Management L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: ENV164C203

Course Objectives:

The aim of this paper is to provide insights into various environmental hazards, their causes, nature, preparedness and assessment of loss so that the students can estimate how human activities interfere with the geophysical processes in causing and/or accentuating natural hazard.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand the concepts of environmental hazard, vulnerability and risk	1, 2
CO2	Identify different types of hazards (natural and man-made) and compare their management strategies and practicability	3, 4
CO3	Assess the mitigation approaches and develop a foundation for hazard, risk and vulnerability assessment	5

Paper IV Core Course	Practical II L-T-P-C: 0-0-8-4 Credit Units: 4 Scheme of Evaluation: (P)	Subject Code: ENV164C214

Course Objectives

The paper will provide the students with appropriate analytical procedures and techniques to help them acquaint with hands on experience on analysis of various environmental parameters involving air, water and soil, followed by application of right statistical tools and techniques for resulting into meaningful scientific information. In addition, the students will be able to map and interpret the different environmental degradation in both space and time using geo-spatial technology.

Course Outcomes

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Apply suitable statistical tools and techniques for the assessment and evaluation of different environmental variables	3
CO2	Analyze different datasets/satellite products for geo-spatial mapping, and interpret the spatial data visually and digitally using GIS software	4, 5
CO3	Assess different environmental parameter (soil, water, air, noise) data on field using scientific devices/tools	5
CO4	Compile analyzed data, prepare scientific reports and design field projects independently	6

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Paper IV DSE	Remote Sensing and GIS			Subject Code: ENV164D201
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The aim is to make the students understand about space and ground data/sources/products and GIS tools so as to make them acquire soft-technical skills and functional knowledge to carry out GIS (RS-GIS) based projects.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand remote sensing and geographic information system (RS- GIS) as a powerful tool for geospatial analysis	1
CO2	Explain satellite data in space and relate to actual ground features for different application	2
CO3	Apply RS-GIS to address real life field issues using different techniques	3
CO4	Examine one or more GIS techniques and compare for various resource management applications	4, 5

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Paper II	Atmospheric Science			Subject Code:
DSE	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	ENV164D202

Course Objectives:

This paper will impart the basic knowledge and concepts of various processes and phenomena in the field of atmospheric science. Also, it will train the students with quantitative and scientific reasoning skills so that they can be well acquainted with probable solutions to various challenges and issues related to atmospheric sciences.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand the concepts, processes and mechanisms of changes in the atmosphere	1, 2
CO2	Identify the processes of atmospheric transport and deposition	3
CO3	Compare the atmospheric processes and interpret the role of atmospheric concepts towards specific functions of earth as a system	4, 5

M. Sc. Course in Environmental Science: Semester-III

Paper I Core Course	Environmental Geoscience			Subject Code:
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	ENV164C301

Course Objectives:

The paper will help in understanding the Earth surface processes that can be used in determining the cause and nature of past and future climate. It will also develop key observational and analytical skills that enable them to address fundamental questions about the functioning of geoscience systems, especially in relation to hydrology and water quality, soils, mineral resources, and climate change.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand the major geological processes occurring in the Earth's crust	1, 2
CO2	Utilize geological methods for minimizing the destructive potential of natural processes for sustainable biosphere on earth	3
CO3	Examine earth as a system of interlinked spheres (geosphere, hydrosphere, biosphere, atmosphere), and explain the unifying paradigms associated with geological time and plate tectonic	4, 5

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Paper II Core Course	Energy and Environment			Subject Code: ENV164C302
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The aim is to give the concept of different energy sources and processes of energy conversion for various uses. Also, it will give an idea about the generation principal of thermal, hydroelectric, geothermal, nuclear etc. energy and the various problems and issues associated with it.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand the concept, working principles, transformation and generation of different forms of energy and their sources	1, 2
CO2	Identify the different initiatives for energy conservation and examine the sustainable use at the global, regional and local scale	3, 4
CO3	Judge the most suitable energy forms to be applied in different environmental conditions in a sustainable manner	5

Paper III Core Course	Solid and Hazardous Waste Management			Subject Code: ENV164C303
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

The aim is to acquaint students with the ability to select the most suitable solid waste management (SWM) options in a specific local context so as to assess the environmental impact of SWM. It will also help the students to assess the economic impact of SWM options and to develop innovative solutions of urban SWM.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Demonstrate sound understanding of the waste generation process and characteristics of different types of solid wastes	1, 2
CO2	Classify the waste management processes through cradle-to-grave perspectives	2
CO3	Apply recycling vis-à-vis resource recovery technologies for useful conversion of specific waste type to eco-friendly products	3
CO4	Discover some alternate solutions and recommend possible implementable SWM plan for urban and peri-urban areas	4, 5

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Paper I DSE	Climate Change and Its Impact	Subject Code
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	ENV164D301

Course Objectives:

To impart basic and key knowledge of the Global Climate Change which will help the students in enhancing knowledge on contribution of greenhouse gases (GHGs)in -global warming, remedial measures against global warming and climate change and policies, global and national action plan related to climate change mitigation.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and illustrate the elements of climate (Global warming, greenhouse effect, GHGs, sources, sinks, GWP) and climate change	1, 2
CO2	Choose the different drivers (anthropogenic and natural) of climate change and outline the impacts on different ecosystems and their sustainability	3
CO3	Compare different policies and agreements regarding climate change and sustainable development goals	4
CO4	Assess the adaptation and mitigation approaches in combating climate change and propose the best suitable strategies for combating through site-specific adaptation	5, 6

Paper II DSE	Environmental Impact Assessment and Legislation	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	ENV164D302

Course Objectives:

The paper aims to introduce the concepts, procedures and methodology of Environmental Impact Assessment (EIA), to develop a critical awareness of factors which affect the use of EIA as part of project management in the legislative and regulatory context of proposed and already existing projects, and to expose the students to the need for EIA and how to prepare the various documents required by state and federal regulations.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and summarize the concepts and components of environmental impact assessment	1, 2
CO2	Develop sound understanding of the EIA process and the methodologies to individually prepare the EMPs	2
CO3	Analyze the developmental actions with the fundamental understanding of EIA and sustainable development.	4
CO4	Interpret EIA that examines the environmental consequences of developmental actions	5

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Paper III DSE	Instrumental Methods and Analysis	Subject Code: ENV164D303
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	

Course Objectives:

The aim is to provide adequate knowledge of the principles, instrumentation and applications of common analytical techniques, including atomic and molecular absorption spectroscopy, electrochemical and separation methods (chromatographic and electrophoretic). Furthermore, the course will help acquire practical command over the extraction processes and handling of solid, liquid and gaseous samples.

Course outcome:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and demonstrate the analytical principles and techniques applied in environmental analysis	1, 2
CO2	Apply QA/QC analytical protocols	3
CO3	Assess different instrumentation techniques to estimate environmental parameters and identify the better methods for analysis for environmental contaminants	4, 5

Paper IV DSE	Ecology and Aquatic Environment	Subject Code: ENV164D304
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	

Course Objectives:

To inculcate the behavioral and physiological mechanisms of organisms' interactions with biotic and abiotic environment. This paper will also provide the knowledge of different types of Ecology, the inter-relationship between organism in population and communities and the problems of niche segregation, speciation, etc.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define the ecology of aquatic systems - population, structure, functions and their importance at the system scale level	1
CO2	Summarize the origin and adaptation of aquatic organisms during the course of evolution	2
CO3	Identify the impacts of aquatic pollution and examine how to use the biological strategies to prevent the pollution.	3, 4

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M. Sc. Course in Environmental Science: Semester-IV

Paper I Core Course	Soil Science			Subject Code: ENV164C401
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

To provide the fundamental knowledge of soil, its chemistry, land use pattern, pollution, degradation, role of microbes in its management, etc. Other objectivesare to provide a better appreciation of the distribution and variability of soils and their properties and knowledge about rational and scientific thinking about the measures to abate soil degradation.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Understand the physical and chemical properties of soil and their effect on plant's health	1, 2
CO2	Make use of the knowledge on soil to rocks and minerals formation, their weathering and climatic factors affecting them	3
CO3	Analyze the causes, effects and conclude the remedies to prevent and mitigate soil/land degradation	4, 5

Paper I DSE	Ecosystem and Biodiversity Conservation			Subject Code: ENV164D401
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

To acquaint students with the understanding on the biodiversity in the context of ecosystem-dynamics, functioning and services provisioning. Through the course, students will acquire practical ability to assess biodiversity with different methodologies and conduct critical measures of analysis to manage biodiversity.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and extend the concept of ecosystems and their biodiversity at different levels; interpret the values of biodiversity and its conservation importance	1, 2
CO2	Identify the different Conventions and Acts related to biodiversity, and transfer the curated knowledge to local communities for real-time conservation awareness	3
CO3	Compare the different conservation techniques and practices, and relate the importance of people participation in protecting regional diversity	4
CO4	Evaluate the methods on biodiversity inventories and plan independent field-surveys	5, 6

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Paper III	Contemporary Environmental Issues			Subject Code:
DSE	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	ENV164D402

Course Objectives

To familiarize students with the scientific understanding of general ecological principles, current environmental issues, and ways that science and society are addressing contemporary environmental problems. Students will gain an understanding of community development, species interactions, and population dynamics, implications of human population growth and anthropogenic alterations to air, water, and land resources, including effects on global biodiversity and potential implications on human health.

Course Outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and demonstrate systematic knowledge of contemporary environmental issues at local, regional and global level	1, 2
CO2	Identify how the environmental crisis will greatly impact both current and future generations and all other species.	3
CO3	Examine over prioritizing among the three pillars of sustainable development for a given environment needs and/or problems.	4, 5

Paper III DSE	Natural Resources and Management			Subject Code: ENV164D403
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

To impart knowledge on different types of renewable and non-renewable energy resources and its conservation management techniques. Also, to instill among the students to use critical thinking skills to convey how society perceives natural resource management vs. the actual management/conservation of our natural resources.

Course outcome:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and outline systematically about the natural resources and its vital role	1, 2
CO2	Identify how and where the Earth's resources are generated, and list their extraction, utilization, and the consequences on natural environment	3, 4
CO3	Compare the different methods of biodiversity conservation and management and develop perspectives on ways to tackle the same sustainably	5, 6

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Paper IV DSE	Environmental Plant Physiology and Biochemistry			Subject Code: ENV164D404
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives:

This paper will provide fundamental knowledge on the physiology of crops affected by physical, chemical, and biotic environment. It centers on developing an understanding of the relationships and interactions of species or crops within communities, and the physiological mechanisms involved in crop responses to environmental conditions and how plants/crops acquire the resources needed for establishing and building the canopies through the growth of various organs.

Course outcomes:

On completion of the course, the students will able to:		Bloom's cognitive Level
CO1	Define and demonstrate the physiological and biochemical responses of plants under changing environmental conditions	1, 2
CO2	Identify and distinguish the plant tolerance mechanism against various environmental pollutants at physiological and molecular level	3, 4
CO3	Explain the critical insights on the adaptive mechanisms of plants against stress	5

Anuradha Dev

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SYLLABUS

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COURSESTRUCTURE

M.A.inPoliticalScience

The Assam Royal Global University
IQAC
Estd : 2018

Anuradha Dey.

Director, IQAC
The Assam Royal Global University

Course:C-I

Title of Paper: Debates inPolitical Theory
PAPER CODE- POL184C101

Marks/Credits:100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
1. To familiarize the students withthemanner in which the political questionswere first posed. 2. To give students an understanding of howthe key concepts in PoliticalTheory had emerged and enriched Political Philosophy through the debates.	1.LectureMethod 2.Assignment 3.Individual and GroupPresentation	1. Have an understandingofthe importance of theoretical inquiry in Politics and the significance of normative judgements in Political context. 2. Develop an understanding of some of the major disagreements and debates that contemporary political theory is engaged with by analysing the perspective of different Political Philosophers.	A. Semesterend examination : 70 marks B B. Internal Assessment:20 marks (Assignment: 10, Assignment Presentation: 05, Class Participation: 05

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Course:C-II

TitleofPaper:ComparativePoliticalAnalysis
PAPERCODE-POL184C102

Marks/Credits:100/4

Course Objectives	Teaching learning process	Learning Outcomes	Course evaluation
1. Togive students an understanding ofthe concepts, theories and the historical experiments of developingcountries aswellasadvanced industrialised countries 2. To give students exposure to the Eurocentric bias in the field of comparative politics, and to identify the processes of de-centring whichhave reconfigured the field insignificant ways	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Have an understanding about the development of Modern States in Europe and non-European Societies. 2. Be able to make a comparativeanalysis of the political, institutional and economic development and underdevelopment of thenationsandabout the evolution of social movements and its impact upon the state structure	A. Semesterend examination:70 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Course:C-III

TitleofPaper:PoliticsinIndia
PAPERCODE-POL184C103

Marks/Credits:100/4

Course Objectives	Teaching learning process	Learning Outcomes	Course evaluation
1. Togivestudents an understandingof thesocietal dynamicsand their impact on Indian political processes. 2. Toacquaint students with how state and politics areinformedby socialprocesses and political mobilizations, historicallyandin contemporary contexts.	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Get an understanding ofthe changingnature of class dominance in India and its impact on political process 2. Get acquainted withhowconcepts such as regionalism, communism, secularism, genderhas created deep impact in IndianPoliticsand electoralsystemand hasin turn effected thepolitical	A. Semesterend examination :70marks B. Internal Assessment:20 marks Assignment:10, Assignment Presentation: 05, Class Participation:05
		Mobilization and citizen's consciousness towards issues ofnational importance.	

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Course:C-IV

Title of Paper: Theories of International Relations
PAPER CODE- POL184C104

Marks/Credits:100/4

Course Objectives	Teaching Learning Process	Learning Outcomes	Course evaluation
1. To give students an understanding of thediversetraditions oftheoretical endeavours in the International Relations as they haveevolvedaround the world. 2. Togivestudentsa thoroughbackground in all schools of IR theory and the debates between themregarding their perspective on the nature of internationalpolitics.	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Be able to learn about the key milestones in world history and will help them withthe toolsto understand and analyze the same from different perspectives 2. Have a thorough background about theapproaches ofIR theoryandthenature of international politicsand howit is tobeconceptualized, understood and judged, bearing in mind theirgeo-culturalspecificities.	A. Semesterend examination:80 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Level ICourse:

DSE 1

Title of Paper:Liberal Political Theory
PAPER CODE- POL184D101
Marks/Credits:100/4

Course Objectives	Teaching learning process	Learning outcomes	Course evaluation
1. The objective of this course is to explore the liberal political theory and how it can yield unique insights and foster critical thinking about political ideas and arguments. 2. To make students aware aboutthe debates on development and various perspectives on the issuesof development.	1.Lecture 2.Assignment 3.Individual and GroupPresentation	1. Shall build an understanding of the nature and value of liberal thinking attached to politics, at the end of the course. 2.After completing this course the studentswillalsobe familiar with the ideals, values and principles attached with the liberal philosophy and its implementation in various constitutional provisions of differentcountries	A. Semesterend examination:80 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Level Semester II

Course: C-I

TitleofPaper:AdministrativeTheory
PAPERCODE-POL184C201
Marks/Credits:100/4

Course Objectives	Teaching-learning process	Learning outcomes	Course evaluation
1. To give students an understandingof the theories that shaped the emergence of the modernsystemsof governanceandthe ir related structuresand processes. Thes e include Western and Non-Western traditions. 2. To increase student's ability to comprehend	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Have aninsight into the various schools of administrative thought and theories that shaped the emergence of modern bureaucracy 2. Have an understanding about the contemporary developments of Public Administration.	A. Semesterend examination:70 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Level Semester III

Course: C-II

Title of Paper: Themes in Indian Political Thought

PAPER CODE- POL184C202

Marks/Credits:100/4

Course Objectives	Teaching-learning Process	Learning Outcomes	Course evaluation
1. To give students an introduction to the richness and variety of the tradition of Indian Political Thought, a tradition that spans centuries if not millennia culminating in the various present day understandings of Indian society. 2. To acquaint students withvarious conflicts and contradictions by focusing on the critical perspectives of Indian Society	1. Lecture 2. Assignment 3. Individual and GroupPresentation	**1.** Have an understanding of the evolution of various traditions which enriched the Indian Society. 2. Be able to compare and analysethe tradition- modernity debates which enriched the Indian Society.	A. Semesterend examination:80 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Course:C-III

Title of Paper: Themes in World Politics and International Political Economy

PAPERCODE-POL184C203

Marks/Credits:100/4

Course objectives	Teaching-learning process	Learning outcomes	Course evaluation
1. Tofamiliarize the students withcertain key concepts for analyzing world politics and the core theoretical issues and empirical explanationsinthe field ofInternational Political Economy (IPE). 2.To introduce studentswiththekey issues pertaining to the relationship betweensecurityand economicaffairs,the tensionsbetweenthe 'national' and 'international' for decision making on matters of global economicgovernance and, politics of international trade, financeandlabour.	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Get familiarized with certain Global Problems challenging the sovereignty of nation states 2. Haveaninsightof the Institutions of Global Governance which shaped International Political Economy.	A. Semesterend examination:80 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Title of Paper:Issues in Political Theory
PAPER CODE-POL184C204
Marks/Credits:100/4

Course objectives	Teaching-learning process	Learning outcomes	Course evaluation
1. Tointroduce students to the common issues that are there in Political Theory. 2. To instil in students an interest in reading original works, in the desire to closely follow the debates around philosophy and to familiarizes students with the manner in which the political questions were first posed.	1.Lecture 2.Assignment 3.Individual and GroupPresentation	1.Have an understanding of the evolution of the key problemsinPolitical Theory and the perspectives which will help them to make a political enquiry 2. Have an insight into the philosophy of politics and Critical theory that emerged at different times under the writingsofdifferent political philosophers and their contribution towards the development of the discourse and later politicalsystem.	A. Semesterend examination:70 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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Level II

Course: DSE2

Title of Paper: State Politics in India
PAPER CODE-POL184D201

Marks/Credits:100/4

Course objectives	Teaching-learning Process	Learning outcomes	Course evaluation
1. To give students an exposuretothestudy oftheIndianCentre-State systems comparatively,along withthepowerofthe Centre and the autonomy of the states within the Indianfederalsystem, which reflect and articulate well-definedregional identities 2. Togivestudents an introduction to the Centre-State relationship in context of liberalization.	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Have an exposure to the study of the Indian Centre-State systems comparatively,along withthepowerofthe Centre and the autonomy of the states within the Indian federal system,whichreflect and articulatewell-defined regional identities. 2. Have an insight intothe processof democratic decentralizationof Indiaanditsrecent trends.	A. Semesterend examination:80 marks B. Internal Assessment:20 marksAssignment: 10, Assignment Presentation: 05, ClassParticipation: 05

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LEVEL:SEMESTERIII

COURSE: C 1

TITLEOFTHEPAPER:ModernIndia:PoliticsandDeterminants

PAPERCODE-POL184C301

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1This course is about introducing students theconflictingideasof whatIndiaistodayand where it mightbe heading. 2The course focuses on the various related discourses of the cultural, social, political, economic, whicharethetopics of intense debate today.	1. Lecture 2. Assignment 3. Individualand Group Presentation	1This paper will provide the students a critical understanding of Indian society and its complex structure. 2Student will also get familiarise with variousperspectivesto study Indian society, nationalism and development. Afterthe course, students will have a clear approach to interpret various aspects of India.	A.Semester end examination:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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LEVEL:SEMESTER3

COURSE:C2

TITLEOFTHEPAPER:DemocracyandPoliticalInstitutions

PAPERCODE-POL184C302

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	Learning Outcomes	Course Evaluation
• Theobjectiveof the course is to introduce students about democracy as a concept and social,economic and political dimensions of democracy in general. • To introduce the students about the Institutionsfrom theoretical points of view andNatureof political institutions in general.	1. Lecture 2. Assignment 3. Individualand Group Presentation	• Have an understanding of the concepts anddimensions of democracy and challenges before democracy, constitutionand Social transformation. • Get a prior understanding ofthepolitical institutions, statemachinery andtheprocess of state building	A.Semester end examination:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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Course:DSE-3

TitleofthePaper:ResearchMethodology

PAPERCODE-POL184D301

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. Thiscourseofferan overview of research methodology including basic concepts employed in quantitative and qualitativeresearch methods. 2. This course introducesresearch methods as they applytothehigher education (HIED) field of study.	1. Lecture 2. Assignment 3.Individual and Group Presentation	1. The students will be trained in research methodologyandable toconductresearchon relevant topics. 2. The students will also understand the methods of research and the techniques of data collection and interpretation of data for smooth conducting ofresearch.	A. Semesterend examination : 70 marks B. Internal Assessment:30 marks (Assignment:15, Assignment Presentation:05, Class Participation: 05, Attendance:05)

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TitleofthePaper:MarxistPoliticalTheory

PAPERCODE-POL184D302

Marks/Credits:100/4

CourseObjectives	TeachingLearning Process	LearningOutcomes	CourseEvolution
1. The paper seeks to give a comprehensive understanding of the Marxist philosophy andMarxistpolitical theory.Apartfrom theideas ofMarxand Engels. 2. The paper also introduces the major contributions ofother Marxist theoreticians like Lenin, Stalin, Gramsci, Mao and the post-War theorists like Althusser, Miliband and Poulantzas.	1. Lecture 2. Assignment 3. Individual and GroupPresentation	1. Studentswillhave a good understanding of the Marxist concepts. 2. Will enable the students to have a critical perspective of the theory based papers.	A. Semesterend examination :70marks B. Internal Assessment: 30 marks (Assignment: 15, Assignment Presentation: 05, Class Participation: 05,Attendance:05)

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LEVEL:SEMESTERIII

COURSE: DSE 5

TITLEOFTHEPAPER:ForeignPolicy ofMajorPowers

PAPERCODE-POL184D303

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. To explorethe foreign policies of the major continentaland worldpowers namely, US, Russia, Chinaand Germany. 1. To analyzethechange and continuity of the foreign policy of major powers.	1. Lecture 2. Assignment 3. Individualand Group Presentation	1. Be ableto understand and evaluatethe changeand continuityof theforeign policyofmajor powers of the world. 2.An insight into the foreign policy into the foreign economic policyofmajor powers and how in thisglobal ized eranewch allenges are addressed and incorporated complementing the national interest.	A.Semester end examinatio n:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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LEVEL:SEMESTERIV
COURSE: C 1
TITLEOFTHEPAPER:SocialMovementsinIndia
PAPERCODE-POL184C401
Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. Social Movementsis a very important componentof Political Science. Learningthis paper will give the studentsthe broad view about the social structure of India. 2. Thepresent paper focuses on thepolitical dimensions of social movements and examines the way the state, political parties and interest groups influence and in turn gets influenced by the social movements.	1. Lecture 2. Assignment 3. Individualand Group Presentation.	1 The students will have an insight into the Social Movements structure of India. 2.Thestudentswillget an idea about the structure of caste other related issues in India.	A.Semester end examination:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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COURSE:C 2

TITLEOFTHEPAPER:IndianGovt.and Politics

PAPERCODE-POL184C402

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. Togive students a prior understanding of the nature ofIndian Government and Politics 2. Togive students an understanding ofthemajor organs of the Governmentof India and nature of Indian Federalism.	1. Lecture 2. Assignment 3. Individualand Group Presentation	1. Get a prior understanding ofthenatureof Indian Government and Politics 2. Getan understanding of the major organs of the governmentof India and nature of Indian Federalism	A.Semester end examination:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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LEVEL:SEMESTER4

COURSE:DSE6

TITLEOFTHEPAPER:GenderandPolitical Theory

PAPERCODE-POLI84D401

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. Toexplorehow reading of political theory textswith an eyetogender can yield unique insights and foster criticalthinking about political ideas andarguments. 2. Tointroduce the students about the debates and issuesrelated to genderandalso familiarizewith the thoughts and writingsof noted theorists who have deliberated in length on that particular issue with emphasis given on readings of original writings.	1. Lecture 2. Assignment 3. Individualand Group Presentation	1. Aninsightintothe emergence and development of women's movement that emerged at different times underthewritings of different political philosophers and theircontribution towards the development of the discourse of political theory. 2. Get an understanding of the origin and development of Women's movementinWest andIndiaandalso will enable the students to understand the contemporary issuesanddebates inGenderStudies.	A.Semester end examinatio n:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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LEVEL:SEMESTERIV

COURSE: DSE 7

TITLEOFTHEPAPER:SocietyandPoliticsinNorth-EastIndia

PAPERCODE-POL184D402

Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1. Tointroduce students about the north-eastas a diverse region of India. 2. To makean understandi ngaboutthe identity movements and peace and conflict resolutionin North East India.	1. Lecture 2. Assignment 3. Individual and Group Presentation	1. Understand the identity issues and socio-political movementsofthe ethniccommunity in North east India. 2. Understand the effectiveness of AutonomyinNorth eastIndiaand problems and conflictsresolutions in North east India.	A.Semester end examination:70 marks. Internal Assessment: 30 Marks (Assignment: 10, Assignment Presentation: 05, Attendance:05) InternalTest:10)

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LEVEL:SEMESTERIV
COURSE: DSE 8
TITLEOFTHEPAPER:India'sForeignPolicy

PAPERCODE-POL184D403
Marks/Credits:100/4

CourseObjectives	Teaching Learning Process	LearningOutcomes	Course Evaluation
1Thedomesticsources and the structural constraints on the genesis,evolutionand practice of India's foreign policy. The endeavour is to highlight integral linkagesbetweenthe 'domestic' and the'international' aspects of India's foreignpolicybystressingon the shifts in itsdomesticidentityand the corresponding changes at theinternational level. 2. About India'sshifting identity as a postcolonial stateto thecontemporary dynamics of India attemptingtocarve itsidentity as an 'aspiringpower'.	1. Lecture 2. Assignment 3. Individualand Group Presentation	1. To understand India's foreign policy in the historicalas well as in the currentcontext. 2. To understand andanalyzethe India'srelations with major powers andregions of the world.	A.Semester end examination: 70marks. Internal Assessment : 30 Marks (Assignment:10, Assignment Presentation:05, Attendance:05) InternalTest:10)

Anuradha Dev

Director, IQAC
The Assam Royal Global University

ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF INFORMATION TECHNOLOGY

(RSIT)

Learning Outcomes based Curriculum Framework (LOCF)

2021-2022

SYLLABUS

&

COURSE STRUCTURE

MCA (2 YEARS)

The Assam Royal Global University
IQAC
Estd : 2018

Anuradha Dev.

Director, IQAC
The Assam Royal Global University

1. Detailed Syllabus of 1st Semester

Paper I/ Subject Name: Object Oriented Programming using JAVA		Subject Code: CAP054C101
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To teach the basic concept and techniques which form the object oriented programming paradigm which is a new way of thinking about problem using models organizes around real world concept.
- To explain the concepts of object oriented programming using JAVA.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Show competence in the use of JAVA language in the development different programs. • Understand the basic principles of the object-oriented programming • Demonstrate an introductory understanding of Graphical userinterfaces, multithreaded programming,andevent-driven programming.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks • End-term examinations:70 marks.

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Paper II/Subject Name : Advanced Data Structure		Subject Code:CAP054C102
L-T-P-C – 4-0-0- 4	Credit Units: 04	Scheme of Evaluation : T

Objective:

The objectives of the course are:

- To explain the basic concepts of Data Structures and Algorithms.
- To give students an in-depth concept of various kinds of Trees.
- To explain detailed concepts on Searching and Sorting.
- To give students exposure to the advanced topics in Data Structures like Graphs, Heaps, Hashing & Collision.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Have the understanding the data structures, their advantages and drawbacks and how they can be overcome. • Have the understanding their applications and their uses. • Have an idea of about the data structure methods or algorithms mentioned in the course so as to make use of them in a program to enhance their efficiency.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks • End-term examinations:70 marks.

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Paper IV/ Subject Name: Computer Organization and Architecture		Subject Code:CAP054C104
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To make the students understand the machine instructions and basic computer organization
- To give an idea of representation of information in computers
- To explain about memory hierarchy and various memory mapping techniques
  To teach I/O subsystems and pipelining processin

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Have an overview of Computer Organization and Architecture. • Have an in-depth concept of the Computer System. • Have detailed concepts on the Central Processing Unit. • Have exposure to Multicore computingand Parallel Organization of Computers.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks • End-term examinations:70 marks.

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Paper V/Subject Name: Object Oriented Programming using JAVA Lab	Subject Code:CAP054C1114-2
L-T-P-C - 0-0-	Credit Units: 02 Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To teach the basic concept and techniques which form the object oriented programming paradigm which is a new way of thinking about problem using models organizes around real world concept.
- To practically explain the concepts of object oriented programming using JAVA.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Show competence in the use of JAVA language in the development different programs. • Understand the basic principles of the object-oriented programming • Demonstrate an introductory understanding of graphical user interfaces, multithreaded programming, and event-driven programming.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks • End-term examinations:70 marks.

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Paper VI/ Subject Name: AdvancedData Structuress Lab		Subject Code:CAP054C112
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme f Evaluation:P

Objective:

The objectives of the course are:

- To explain practically the concepts of Data Structures and Algorithms.
- To provide an in-depth practical experience of various kinds of Trees.
- To give students detailed practical experience on Searching and Sorting.
- To teach the advanced topics in Data Structures like Graphs, Heaps, Hashing & Collision.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Learn the implementation of various data structures through C++. • Understandthe applications and uses of data structures in real world. • Learn to analyze the efficiency of algorithms.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks • End-term examinations:70 marks.

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PaperVIII/ Subject Name: Fundamentals of Organizational Behaviour		Subject Code:BHS984A103
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To provide students with a better understanding of organizational behavior and insight into the vital parts ofan organization, namely, communication and culture

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Have a better understanding of organizational behavior and insight into the vital parts of an organization, namely, communication and culture.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in classdiscussions (b)Continuous Evaluation(30 Marks) (i)15 marks on □ Assignments □ Class tests. □ viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70marks.

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Paper IX/ Subject Name: Communication: Skills, Concepts and Applications		Subject Code:CEN984A101
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give students an exposure to the basics of communicationimproving their business writing skills, group communication and speaking skills in English by engaging them for meaningful discussion and interactive activities.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Be familiar with the basics of writing, speaking and group communication.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on □ Assignments □ Class tests. □ viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper IX / Subject Name: Communication: Skills, Concepts and Applications		Subject Code:CEN9B4A101
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give students an exposure to the basics of communication,improving their business writing skills, group communication and speaking skills in English by engaging them for meaningful discussion and interactive activities.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Be familiar with the basics of writing, speaking and group communication.	vi) Each topic to be expounded with adequate examples. vii) Class discussions and question- answer rounds are encouraged viii) theoretical problems solving is part of the class to grasp the underlying concepts ix) Students have to go through case studies for real time experience x) Students to be encouraged to give short presentations.	(c) Participation in class discussions (d)Continuous Evaluation(30Marks) (i)15 marks on □ Assignments □ Class tests. □ viva-voce or presentation (iv) Mid-term examinations :10 marks (v) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper IV/ Subject Name: Pattern Recognition		Subject
Code:CAP054C204L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To explain the design and construction and a pattern recognition system and the major approaches instatistical and syntactic pattern recognition.
- To provide an exposure to the theoretical issues involved in pattern recognition system design.
- To teach the working knowledge of implementing pattern recognition techniques and the scientific Python computing environment.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Learn the design and construction and a pattern recognition system •Understand the working knowledge of implementing pattern recognition techniques and the scientific Python computing environment. Analyze the different features extracted from datasets	i) Each topic to be expounded with adequate examples. ii) Class discussions and question-answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations : 10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper V/Subject Name: Advanced Computer Networks Lab		Subject Code: CAP054C211
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To give students practical experience on the use of various devices as well as simulation tools for Have practical experience on the use of various devices as well as simulation tools for Computer Networking.
- To provide a practical experience on the implementation on various protocols of Computer Networks.
- To teach the analysis of the performance of the protocols in different layers.
- To give a practical experience on the analysis of various routing algorithms.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Know about different Network components. •Learn about client-server programming •Learn and differentiate between TCP and UDP servers •Learn about network simulators.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VI/ Subject Name: Advanced Database Management Systems Lab		Subject Code: CAP054C212
L-T-P-C – 0-0-4-2	Credit Unit -2	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To provide in-depth knowledge on database concepts.
- To teach the concepts of relational data model.
- To impart practical to experience designing and constructing data models and using SQL to interface to both multi-user DBMS packages and to desktop DBMS packages.
- To explain the usage of DDL and DML commands in RDBMS.
- To make the students practice advanced concepts in databases, like High Level Language Extensions with cursors, triggers, procedures and functions.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Have a practical review of the concepts of DDL and DML commands. • Have a practical exposure to the usage of Cursors and Triggers. • Have the practical experience of Procedures and functions, along with hands on experience with Embedded SQL. • Have the practical experience of a real life information system's DBMS design, as well as know how to tackle the challenges faced during such a real life project.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • **Continuous Evaluation: 25%** (Skill Test, lab copy, viva, lab involvement: Any Three) • **Attendance:** 5% • **End term examination:** 70 %

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Paper VIII / Subject Name: Individual and Intrapersonal Behaviour		Subject Code:BHS984A203
L-T-P-C – 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To provide students with a platform to understand individual and interpersonal behavior within an organization, thus building insight into the dynamics of employee attitudes, satisfaction, conflict and power politics.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Understand individual and interpersonal behavior within an organization, thus building insight into the dynamics of employee attitudes, satisfaction, conflict and power politics.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question-answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper IX/ Subject Name: : Business Environment and Communication		Subject Code:CEN984A201
L-T-P-C - 1-0-0-1	Credit Units: 01	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give a comprehensive view of corporate communication, cross cultural communication by engaging them to meaningful discussion and interactive activities

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Know communication skills required in corporation and work as a team, comprehend cross cultural communication and improve their technical writing skills.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation[30Marks] (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper 1/ Subject Name: Design and Analysis of Algorithms		Subject Code: CAP054C301
L-T-P-C - 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To teach the fundamental algorithms
- To explain how to analyse the performance of algorithms
- To teach the fundamental algorithmic design strategies

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Describe the major modern algorithms and selected techniques that are essential to today's computers. •Decide on the suitability of a specific algorithm design technique for a given problem. •Apply the algorithms and design techniques to solve problems, and mathematically evaluate the quality of the solutions.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper II/ Subject Name: Web Technologies		Subject Code: CAP054C302
L-T-P-C - 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give students an introduction to the Internet and Web Page Design.
- To provide detailed concepts on Web Browsers, Markup Language Basics and XML.
- To impart detailed concepts on Web Server Side technologies.
- To give students exposure to some Advanced Web Technologies and the Web Security.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
• Analyze a web page and identify its elements and attributes. • Create web pages using HTML and Cascading Style Sheets. • Build dynamic web pages using JavaScript (Client side programming). • Create XML documents and Schemas. • Build interactive web applications using AJAX.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question-answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests. viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper III/ Subject Name: Advanced Software Engineering		Subject Code: CAP054C303
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To explain the basics and life cycle of software engineering.
- To discuss different system process models
- To explain the basic concepts of software testing.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Explain various phases of software development lifecycle 2. Analyze and document the requirement specifications for a software project 3. Develop the process model using standard tools and methodologies 4. Implement a quality software project through effective team-building planning, scheduling and risk assessment.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ! Assignments ! Class tests. ! viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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PaperIV/Subject Name: Design and Analysis of Algorithm Lab		Subject Code: CAP054C311
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To teach the fundamental algorithms
- To explain how to analyze the performance of algorithms
- To teach the fundamental algorithmic design strategies

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Describe the major modern algorithms and selected techniques that are essential to today's computers. •Decide on the suitability of a specific algorithm design technique for a given problem. •Apply the algorithms and design techniques to solve problems, and mathematically evaluate the quality of the solutions.	i) Familiarization with essential tools , language and software has been inducted ii) Related concept are discussed before each practical iii) student are encourage to take up real problem and solve in group iv) Case study and its practical implementation is a part of the curriculum v) Students to be encouraged to take up software development in related fields	(a) Participation in Practical Assignments (b)Continuous Evaluation(30Marks) (i) 15 marks on Lab Assignments viva-voce (ii) Skill Test cries:10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper V/ Subject Name: Web Technologies Lab		Subject Code: CAP054C312
L-T-P-C – 0-0-4-2	Credit Units: 02	Scheme of Evaluation: P

Objective:

The objectives of the course are:

- To give students a practical introduction to the Internet and Web Page Design.
- To explain practical concepts on Web Browsers, Markup Language Basics and XML.
- To teach concepts on Web Server Side technologies.
- To give students hands-on exposure to some Advanced Web Technologies and the Web Security.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Learn web page designing in detail using various client side and server side scripting. •Learn CSS. •Understand the development of XML documents. Know about AJAX	i) Familiarization with essential tools , language and software has been inducted ii) Related concept are discussed before each practical iii) student are encourage to take up real problem and solve in group iv) Case study and its practical implementation is a part of the curriculum v) Students to be encouraged to take up software development in related fields	(a) Participation in Practical Assignments (b)Continuous Evaluation(30Marks) (i)15 marks on Lab Assignments viva-voce (ii) Skill Test cries:10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VII/Subject Name: Data Science using R		Subject Code: CAP054D401
L-T-P-C - 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To introduce the mathematical foundations required for data science.
- To explain the first level data science algorithms and a data analytics problem solving framework
- To introduce a practical capstone case study
- To teach R and Python as a tool for Data Analytics technique

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Identify a flow process for data science problems • Classify data science problems into standard typology • Develop R or Python codes for data science solutions • Correlate results to the solution approach • Assess the solution approach and Construct use cases to validate approach and identify modifications required	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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VII/Subject Name: Paper Distributed Systems		Subject Code: CAP054D102
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give students an introduction to the characteristics of distributed systems.
- To provide an exposure to processor arrays and multiprocessor multi-computers
- To impart the idea of the distributed architectures, examples of DS and also difference between parallel computing and distributed computing.

To give students the understanding of transaction processing in distributed manner

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Identify the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion, deadlock detection, agreement, etc. • Design and develop distributed programs using sockets and RPC/RMI. • Differentiate between different types of faults and fault handling techniques in order to implement fault tolerant systems. • Analyze different algorithms and techniques for the design and development of distributed	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.
systems subject to specific design and performance constraints.		

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Paper VII/Subject Name: Natural Language Processing		Subject Code:CAP054D103
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To provide the student with knowledge of various levels of analysis involved in NLP.
- To understand language modeling.
- To gain knowledge in automated natural language generation and machine translation

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Appreciate the fundamental concepts of Natural Language Processing. • Design algorithms for NLP tasks. • Develop useful systems for language processing and related tasks involving text processing	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30 Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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Paper VII/Subject Name: Neural Networks and Fuzzy Logic		Subject Code:CAP054D104
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To teach the concepts of artificial neural networks
- To explain the basic theory and algorithm formulation of Fuzzy logic.
- To describe real world problems

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Know about different neural networks, their architecture and training algorithm. •Learn the concept of Fuzzy logic, Fuzzy Sets, fuzzy rules and fuzzy reasoning •Get exposed to the applicability of neural networks and fuzzy logic	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ! Assignments ! Class tests. ! viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VII/Subject Name: Bioinformatics		Subject Code: CAP054D201
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To improve the programming skills of the student.
- To let the students know the recent evolution in biological science

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Develop bioinformatics tools with programming skills. •Apply computational based solutions for biological perspectives. •Practice life-long learning of applied biological science	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on Assignments Class tests viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VII/Subject Name: Wireless Computing		Subject Code: CAP054D202
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To make the students understand the basic concepts of mobile computing.
- To make them familiar with the network protocol stack.
- To explain the basics of mobile telecommunication system.
- To provide an exposure to Ad-Hoc networks.
- To impart knowledge about different mobile platforms and application development

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Understand the basic concepts of mobile computing and the network protocol stack. • Learn the basics of mobile telecommunication system and Ad-Hoc networks. • Gain knowledge about different mobile platforms and application development	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problems in the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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Paper VII/Subject Name: Soft Computing		Subject Code: CAP05D203
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To make the students understand the basics of soft computing and fuzzy logic
- To give an idea of artificial neural networks and its applications
- To explain genetic algorithms with example
- Introduction to Rough set and understand different soft computing tools to solve real life problems.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
• Discuss the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience • Relate with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems • Describe with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations • Develop some familiarity with current research problems and research methods in Soft Computing Techniques.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ! Assignments ! Class tests. ! viva-voce or presentation (ii) Mid-term examinations:10 marks (iii) Class attendance-5 marks (c) End-term examinations: 70 marks.

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ELECTIVE-III

Paper VI/Subject Name: Artificial Intelligence		Subject Code:CAP054D301
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To present an overview of artificial intelligence (AI) principles and approaches.
- To provide a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Understand the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning. •Have read and analyzed important historical and current trends addressing artificial intelligence.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ! Assignments ! Class tests. ! viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VI/Subject Name: Big Data Analytics		Subject Code:CAP054D302
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To give students an exposure to Apache Hadoop Architecture and Ecosystem.
- To provide concepts on HDFS and Map reduce.
- To explain querying data using Hive and Pig.
- To expose students to Real Time Databases using HBase.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
• Identify Big Data and its Business Implications. • List the components of Hadoop and Hadoop Eco-System. • Access and Process Data on Distributed File System. • Manage Job Execution in Hadoop Environment. • Develop Big Data Solutions using Hadoop Eco System. • Apply Machine Learning Techniques using R.	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ! Assignments ! Class tests. ! viva-voce or presentation (ii) Mid-term examinations:10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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ELECTIVE-IV

Paper VII/Subject Name: Cloud Computing		Subject Code:CAP054D303
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To introduce the students the broad perceptive of cloud architectural model and the concept of Virtualization.
- To make students familiar with the lead players in cloud and understand the features of cloud simulator.
- To give students the concepts on applying different cloud programming model as per need and make them able to set up a private cloud.
- To make students understand the design of cloud Services and trusted cloud Computing system.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Understand the fundamental principles of distributed computing •Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing •Understand the business models that underlie Cloud Computing •Understand concepts of IAAS, SASS, PAAS	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on □ Assignments □ Class tests. □ viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Paper VII/Subject Name: Cyber Forensics		Subject Code: CAP054D304
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To provide an understanding Computer forensics fundamentals.
- To explain various computer forensics technologies.
- To provide an understanding of the computer forensics systems.
- To teach methods for data recovery.
- To explain the methods for preservation of digital evidence.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Understand the definitionof computer forensics fundamentals. • Describe the types of computer forensics technology. • Analyze various computer forensics systems. • Illustrate the methods for data recovery, evidence collection and data seizure. • Summarize duplication and preservation of digital evidence.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problemsin the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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Paper VII/Subject Name: Internet of Things		Subject Code: CAP054D305
L-T-P-C – 4-0-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To provide a foundation in computing, communication and information technologies.
- To make student realize the revolution of Internet in Mobile Devices, Sensor Networks and Cloud technology.
- To develop the teamwork skills, multidisciplinary approach, and an ability to relate information technology to overcome real world and social issues.
- To induce students with good computing and communication knowledge so as to understand, analyze, design, and innovate a new system

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Show the understanding of impact of information technology solutions on the society. • Understand the application areas of IOT. • Understand building blocks of Internet of Things and characteristics. • Explored to the interconnection and integration of the physical world and the cyber space. • Design & develop IOT Devices.	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problemsin the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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Paper VII /Subject Name: Cryptography and Network Security		Subject Code: CAP054D306
L-T-P-C – 3-1-0-4	Credit Units: 04	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To explain about the various encryption techniques.
- To make the students understand the concept of Public key cryptography.
- To teach about message authentication and hash functions.
- To impart knowledge on Network security.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
On completion of this course the students will be expected to: • Classify the symmetric encryption techniques. • Illustrate various Public key cryptographic techniques. • Evaluate the authentication and hash algorithms. • Discuss authentication applications. • Summarize the intrusion detection and its solutionsto overcome the attacks and the basic concepts of system level security	• Each topic to be explained with examples. • Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. • Students to be given homework/assignments to make their concept clear. • Discuss and solve the problemsin the class.	• Participation in class discussions • Continuous Evaluation(30Marks) (i)15 marks on Assignments, class tests, viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance:5 marks End-term examinations:70 marks.

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9. Syllabus of Ability Enhancement Elective Curses

Subject Name: General Aptitude and Quantitative Reasoning-I		Subject Code:INT054S201
L-T-P-C – 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem.
- To demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
- To interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem. •Recall Formulae. •Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. •Interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them. Critically evaluate various real life situations by resorting to analysis of key issues and factors	i) Each topic to be expounded with adequate examples. ii) Class discussions and question-answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on 1 Assignments 1 Class tests, 1 viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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Subject Name: General Aptitude and Quantitative Reasoning-		Subject Code: INT0545302
L-T-P-C – 2-0-0-2	Credit Units: 02	Scheme of Evaluation: T

Objective:

The objectives of the course are:

- To formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem.
- To demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
- To interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them.

Facilitating the Achievement of Course Learning Outcomes

Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
•Formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem. •Recall Formulae. •Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. •Interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them. •Critically evaluate various real life situations by resorting to analysis of key issues and factor	i) Each topic to be expounded with adequate examples. ii) Class discussions and question- answer rounds are encouraged iii) theoretical problems solving is part of the class to grasp the underlying concepts iv) Students have to go through case studies for real time experience v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on ⁞ Assignments ⁞ Class tests. ⁞ viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

Anuradha Das

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

Royal School of Applied & Pure Sciences (RSAPS)
Department of Mathematics

M.Sc. in Mathematics

Learning Outcomes based Curriculum Framework (LOCF)
(Upto 20% MOOCs/Blended Mode)

2021

SYLLABUS
&
COURSE STRUCTURE

The Assam Royal Global University IQAC Estd : 2018

Anuradha Deu

Director, IQAC
The Assam Royal Global University

SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Algebra-I (25% Blended Mode)		**Subject Code: MAT014C101**
: 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objectives of **ALGEBRA-I (MAT014C101)** are:

1. To provide the continuous approach to the subject of algebra, which is one of the basic pillars of modern mathematics and to inculcate in students the power of accurate analysis.
2. To provide an insight for further study into applications of abstract algebra in certain areas by knowing to perform algorithms.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i)Describe the theorems and properties of certain abstract algebraic structures in groups, rings, fields and modules. (ii)Apply course material along with techniques and procedures covered in this course to solve problems.	(i) Each topic to be explaineded with examples. (ii)Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. (iii) Students to be given homework/assignments to make their concept clear. (iv) Discuss and solve the theoretical problems in the class. (v) Module IV to be taught blended mode as per above E-Reference.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Paper II/Subject Name: Linear Algebra (25% Blended Mode) | **Subject Code: MAT014C102**

L-T-P-C: 4-0-0-4 | **Credit Units: 4** | **Scheme of Evaluation: T**

Objectives: The objectives of **Linear Algebra (MAT014C102)** are

- to impart learning behaviour of different types of linear spaces and its applications.
- to make the student understanding behaviour of linear mappings on linear spaces.
- to enable learning the concept of basis and dimension of vector spaces, orthogonality of vectors in inner product spaces, matrix representation of linear transformation.
- to train on the use of canonical forms and bilinear forms.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to i) Construct basis and dimension of linear spaces and their applications. ii) Define linear mappings and its matrix representation on various linear spaces. iii) Justify positivity of a linear mapping. iv) Construct Jordan form and bilinear form.	i) Each topic to be expounded with examples. ii) Students to be motivated to take part in discussions and ask questions. iii) Students to be given homework/assignments. iv) Discuss and solve the theoretical problems in the class. v) Students to be encouraged to give short presentations. vi) Module II to be taught blended mode as per above E-Reference.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

SYLLABUS (1ST SEMESTER)

Paper III/Subject Name: Real Analysis | **Subject Code: MAT014C103**

L-T-P-C: 4-0-0-4 | **Credit Units: 4** | **Scheme of Evaluation: T**

Objective: Objectives of the course **Real Analysis (MAT014C103)** is

- To introduce the concepts of various types of integrals and convergences of functions.
- To enable learning fundamental concepts of multivariable analysis.
- To impart understanding fundamental concepts of Real analysis and its application.

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Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able 1. Learn to determine the Riemann integrability and the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorem concerning integration. 2. Understand different types of improper integrals. 3. Recognize the difference between pointwise and uniform convergence of a sequence of functions. 4. Learn the effect of uniform convergence on the limit function with respect to continuity, differeniability and integrability.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Paper IV/Subject Name: Ordinary Differential Equations		Subject Code: MAT014C104
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Ordinary Differential Equations (MAT014C104)** are

- To provide fundamental concepts of ODE theories and where and how such equations arise in applications to scientific and engineering problems.
- To enable developing the ability to apply differential equations to significant applied and/or theoretical problems.
- To explain most of the physical phenomena from Science and Engineering which are modelled by differential equations.
- To enable finding and interpreting the solutions of the ODE appearing in dynamical systems, stability theory and a number of applications to scientific and engineering problems.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Learn to solve problems in ordinary differential equations, dynamical systems, stability theory, and a number of applications to scientific and engineering problems. 2. Demonstrate their ability to write coherent mathematical proofs and scientific arguments needed to communicate the results obtained from differential equation models. 3. Implement solution methods using appropriate theory, and 4. Investigate the qualitative behavior of solutions of systems of differential equations and interpret in the context of an underlying model.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations:10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Paper I/Subject Name: Probability & Statistics (25% Blended Mode)		**Subject Code: MAT014D101**
: 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objectives: The objectives of **Probability & Statistics (MAT014D101)** are

- To enable learning fundamental concepts of probability theory.
- To introduce the basic concepts of one dimensional and two dimensional Random Variables.
- To provide information about Estimation theory, Correlation, Regression and Testing of hypothesis.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Measure uncertainties under some suitable circumstances. (ii) Apply theoretical probability distribution in real life problems. (iii) Find the bivariate probability distribution and their related real life problems. (iv) Estimate the best representative of the population parameter and apply it in test of significance.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in theclass. (v) Students to be encouraged to give short presentations. (vi) Module I and II to be taught partly blended mode as per above E-reference.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Paper II/Subject Name: Introduction to Computing		Subject Code: MAT014D102
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: TP

Objective: The objectives of **Introduction to Computing (MAT014D102)** are

- To provide the basic knowledge of computer peripherals.
- To impart understanding fundamental concepts of programming languages.
- To train on the use of programming languages analytically which will be useful for numerical computations also by understanding the basic implementation techniques.

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Understand the basic terminology used in computer programming 2. Write, compile and debug pr ograms in C language. 3. Use different data types in a computer program. 4. Design programs involving decision structures, loops and functions. 5. Explain the difference between call by value and call by reference 6. Understand the dynamics of memory by the use of pointers. 7. Use different data structures and create/update basic data files.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Subject Name: Operations Research-I (25% Blended Mode) **Subject Code: MAT014D103**

: 4-0-0-4 Credit Units: 4 **Scheme of Evaluation: T**

Objective: The objectives of **Operations Research-I (MAT014D103)** are

- To make the students understand operations research and its importance in human decision making.
- To impart learning fundamentals of the OR models.
- To explain how to formulate and solve different linear programming models.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able 1. To Define and formulate linear programming problems and appreciate their limitations. 2. To conceptualize the feasible region. 3. To identify the special features of the transportation and assignment problem. 4. To understand the types of problems that can be solved by applying transportation and assignment model. 5. To differentiate between feasible and optimal solutions. 6. To understand basics of game theory. 7. To acquire an idea about the computational procedure of DP	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations. (vi) Module III will be taught in blended mode.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (1ST SEMESTER)

Paper IV/Subject Name: Introduction to Mathematical Modelling
Subject Code: MAT014D104
L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The objectives of **Introduction to Mathematical Modelling (MAT014D104)** are

- To expose student to understand the importance of Mathematical modelling.
- To impart understanding fundamental techniques of mathematical modelling.
- To enable learning different classifications and simple illustrations of mathematical modelling.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Describe the real world problems in the form of mathematics by using differential equations. (ii) Develop the models graphically and with the help of delay method, differential difference equations etc. (iii) Understand optimization models, computational method of solving the models.	(i) Each topic to be expounded withexamples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in theclass. (v) Students to beencouraged to give shortpresentations.	(a)Participation in classdiscussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • classtests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Partial Differential Equations (25% Blended Mode)		Subject Code: MAT014C201
: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Partial Differential Equations (MAT014C201)** are

- To introduce the concepts and explain how to solve Partial Differential with different methods.
- To enable developing the ability to apply partial differential equations to significant applied and/or theoretical problems.
- To enable finding and interpreting the solutions of the PDE appearing in dynamical systems, stability theory and a number of applications to scientific and engineering problems.
-

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Develop fundamental concepts of PDE theories and their applications to scientific and engineering problems 2. Learn to solve the heat equation, wave equation, and the Laplace equation subject to boundary conditions 3. Demonstrate their ability to write coherent mathematical proofs and scientific arguments needed to communicate the results obtained from partial differential equation models. 4. Investigate the qualitative behaviour of solutions of systems of partial differential equations and interpret in the context of an underlying model.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications. (vi) Module IV to be taught in blended mode as per above E-Reference.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations: 10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper II/Subject Name: Topology		Subject Code: MAT014C202
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Topology-I (MAT014C202)** are

- To enable learning cardinality of sets, topological space, different types of topology, continuity in terms of topological space, connectedness, compactness and countability of sets.
- To impart understanding behaviour of limit points, neighbourhoods and continuity in metric spaces and topological spaces.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Students will be able to 1. Learn concept of different types of topologies, familiarize with limit points, bases, subbases of topologies. 2. Understand continuity, homomorphism, connectedness of topological spaces 3. Know the concept of compactness in topological spaces. 4.Familiarize with Housdorff spaces, Regular spaces, normal spaces.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper III/Subject Name: Functional Analysis		Subject Code: MAT014C203
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Functional analysis (MAT014C203)** are

- to provide information of spaces of functions.
- to enable learning the concept of completeness of inner product spaces and normed vector spaces.
- to make the student understand boundness of linear operators, and its spectrum.
- to impart understanding the basic concepts and theorems of functional analysis and its applications.

Facilitating the Achievement of Course Learning Outcomes:

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to i) describe properties of normed linear spaces and construct examples of such spaces. ii) extend basic notions from calculus to Inner product spaces and normed vector space. iii) Analyse various mappings on finite and infinite dimensional normed vector spaces. iv) Understand decomposition of complex plane in terms of spectrum	i) Each topic to be expounded with examples. ii) Students to be motivated to take part in discussions and ask questions. iii) Students to be given homework/assignments. iv) Discuss and solve the theoretical problems in the class. v) Students to be encouraged to give short presentations. vi) Students to be motivated to derive useful theoretical tools.	a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations: 70 marks.

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SYLLABUS (2nd SEMESTER)

Paper IV/Subject Name: Complex Analysis (25% Blended Mode)		Subject Code: MAT014C204
: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Complex Analysis (MAT014C204)** are

- To extend the concepts of analysis of real variables to complex variables.
- To develop specific skills throughout the course to solve problems and for further study in the related fields.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
• Get the concept of Integration of Complex functions and Carry out contour Integration. • State and provide proofs of the Fundamental Theorem of Algebra and various important theorems. • Apply techniques of Complex analysis to summation of series. • Compute complex line integrals and real integrals using residues. • Explain the concept of transformation in a complex space and apply conformal mappings to problems from physical sciences..	i) Each topic to be explained with examples. ii) Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. iii) Students to be given homework/assignments to make their concept clear.. iv) Discuss and solve the theoretical problems in the class. v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Numerical Analysis (50% Blended Mode)		Subject Code: MAT014D201
: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: TP

Objective: The objectives of **Numerical Analysis (MAT014D201)** are

- To enable solving algebraic and transcendental equations.
- To impart appropriate numerical methods to solve a differential equation.
- To derive appropriate numerical methods to solve a linear system of equations.
- To perform an error analysis for various numerical methods.
- To provide appropriate numerical methods to calculate a definite integral.
- To enable developing code for various numerical methods in a modern computer language.

Course Outcomes:

Student will be able to

- Solve an algebraic or transcendental equation using an appropriate numerical method
- Solve a differential equation using an appropriate numerical method.
- Solve a linear system of equations using an appropriate numerical method
- Perform an error analysis for a given numerical method
- Calculate a definite integral using an appropriate numerical method
- Code a numerical method in a modern computer language

LAB PROGRAMMES

- Bisection method
- Regula Falsi method
- Newton-Raphson method
- Gauss Elimination method
- Gauss – Jordan method
- Gauss Seidel method
- LU factorization
- Solution of Differential Equations (Euler's method, RK4 method)
- Numerical Integration (Trapezoidal and Simpsons' rule)

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SYLLABUS (2nd SEMESTER)

Paper I/Subject Name: Discrete Mathematics		Subject Code: MAT014D202
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Discrete Mathematics (MAT014D202)** are

- To enable learning fundamental concepts of relations and functions.
- To impart understanding basic knowledge of number theory.
- To enable learning fundamental concept of coding theory.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to 1. Apply coding theory in the field of technology. 2. Apply logical operations basically in the field of computer science. 3. Understand mathematical algebraic structures.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations : 10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper III/Subject Name: Operations Research-II		Subject Code: MAT014D203
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Operations Research-II (MAT014D203)** are

- To enable understanding the meaning of duality and its role in the solutions to optimization problems.
- To impart understanding of some advanced linear programming techniques.
- To make the student understand and arrive at optimal or near-optimal solutions to complex problems involving some form of decision making.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • Solve multi objective linear programming problems. • Solve linear programming problems with limitations on values taken by decision variables. • Understand the basic concept of queuing and simulation models. • Solve NLPP. • Understand the importance of convexity and concavity in the nonlinear optimization problems.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (2nd SEMESTER)

Paper IV/Subject Name: Stochastic processes		Subject Code: MAT014D203
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Stochastic processes (MAT014D204)** are

- To impart understanding fundamental concepts of Markov chain.
- To provide exposure to probabilistic model.
- To enable learning the application of Stochastic processes in real situations.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Understand the application of probability in time dependent processes. (ii) Apply the processes in Markov chain, birth and death processes, queuing theory, Brownian motion, Branching and stationary processes.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Mathematical Methods (25% Blended Mode) **Subject Code: MAT014C301**

: 4-0-0-4 Credit Units: 4 **Scheme of Evaluation: T**

Objective: The objectives of **Mathematical Methods (MAT014C301)** are

- To provide the concepts of different mathematical methods which have different applications.
- The make the student understand and develop specific skills throughout the course to solve problems in application fields.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to i) Get the knowledge of Calculus of variations as well as their applications. ii) Know in details of Integral equations and their applications. iii) Learn different special functions.	i) Each topic to be explained with examples. ii) Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. iii) Students to be given homework/assignments to make their concept clear.. iv) Discuss and solve the theoretical as well as problems in the class. v) Students to be encouraged to give short presentations. vi) Module IV to be taught in blended mode as per above E-Reference.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper II/Subject Name: Graph Theory		Subject Code: MAT014C302
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of the course **Graph Theory (MAT014C302)** are

- To enable understanding and apply the fundamental concepts in graph theory.
- To impart the application of graph theory based tools in solving practical problems.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
Upon successful completion of this course, students will be able to • Understand and explain the basic concepts of graph theory. • Apply principles and concepts of graph theory in practical situations	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper I/Subject Name: Number Theory-I		Subject Code: MAT014D301
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objectives: The objectives of **Number Theory-I (MAT014D301)** are

- To impart understanding basic structure and properties of integers.
- To enable improving one's ability of mathematical thinking.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to 1. Identify and apply various properties of integers including primes, the division algorithm, greatest common divisor, least common multiple. 2. Learn the concept of congruence and various properties of congruence. 3. Solve certain types of Diophantine equations. 4. Identify certain number theoretic functions and their properties. 5. Understand the concept of primitive roots, quadratic reciprocity, quadratic residue.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper II/Subject Name: Algebraic Topology		Subject Code: MAT014D302
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Algebraic Topology (MAT014D302)** are

- To provide tools from abstract algebra to study topological spaces.
- To enable solving algebraic problems using topology.
- To make the student understand and apply homotopy groups to classify topological spaces.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Classify topological spaces using tools of abstract algebra. (ii) Solve algebraic problems using topology. (iii) Use homotopy groups to classify topological spaces. (iv) Describe homology to associate a sequence of abelian groups	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations. (vi) Students to be motivated to apply the concepts in application parts.	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)		
Paper III/Subject Name: Mathematical Logic		**Subject Code: MAT014D303**
L-T-P-C: 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objectives of the course **Mathematical Logic (MAT014D303)** are

- To introduce the concepts of statement and truth values assigned
- To enable establishing different theories of mathematical logic;
- To make the student understand the application of mathematical logic.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Express a logical sentence in terms of predicates, quantifiers, and logical connectives. formulate and interpret statements presented in Boolean logic. (ii) Reformulate statements from common language to formal logic. Apply truth tables and the rules of propositional and predicate calculus. (iii) Define logical system using valuation and consistency (iv) Understand Informal and formal predicate calculus	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations. (vi) Students to be motivated to apply the concepts in higher studies	(a) Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper IV/Subject Name: Classical Mechanics (25% Blended Mode) **Subject Code: MAT014D304**

: 4-0-0-4 Credit Units: 4 **Scheme of Evaluation: T**

Objective: The objectives of **Classical Mechanics (MAT014D304)** are

- To impart the student how to use differential equations and other advanced mathematics in the solution of the problems of classical mechanics.
- To enable applying Newton's laws of motion to solve advanced problems involving the dynamic motion of classical mechanical systems.
- To provide idea how to represent the equations of motion for complicated mechanical systems using the Lagrangian and Hamiltonian formulations of classical mechanics.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Understand clearly the notion of degrees of freedom, and identify them for a given mechanical system. 2. Apply mathematics skills to classical mechanics problems. 3. Learn to find the Lagrangian and the Hamiltonian, set up and solve the equations of motion for any reasonable mechanical system. 4. Identify existing symmetries and the corresponding integrals of motion; analyse the qualitative nature of dynamics on the basis of general principles without explicitly solving equations of motion.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications. (vi) Module IV to be taught in blended mode as per above E-Reference.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations: 10 marks (iii) Class attendance -5 marks (c) End-term examinations-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper V/Subject Name: Differential Geometry		Subject Code: MAT014D305
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Differential Geometry (MAT014D305) are**

- To provide the students a minimum knowledge of Space curves
- To impart the students a minimum knowledge of Revolution of surface

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • study the movements of curves. • know the Fundamental existence theorem, uniqueness theorem for space curves. • study the surface and its direction. • know Surface in Monge's form. • Developable associated with space curves, curves on surfaces. • gather knowledge on Geodesics , Gauss-Bonnet theorem,	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper VI/Subject Name: Continuum Mechanics		Subject Code: MAT014D306
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Continuum Mechanics (MAT014D306)** are

- To provide exposure the basic elements of continuum mechanics.
- To introduce the concepts of fundamental laws of continuum Mechanics.
- To prepare student to appreciate a wide variety of advanced courses of mechanics.
- To enable applying theory of continuum mechanics to solve problems of solid and fluid dynamics.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Understand the basic concept and principle of continuum mechanics. 2. Learn to solve the problems of solid and fluid mechanics. 3. Appreciate a wide variety of advanced courses in solid and fluid mechanic. 4. Analyze the fluid flow problems for different coordinate systems.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations:10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper VII/Subject Name: Multivariate Analysis-I		Subject Code: MAT014D307
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: Theory

Objective: The objective of **Multivariate Analysis-I (MAT014D307)** is

- To impart the minimum knowledge of discrete probability distribution and estimation of their parameters.
- To make the student understand and apply Multivariate analysis –I in other branch of mathematics

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i)Understand the application of binomial and multinomial distribution (ii)Apply negative binomial distribution in some problem like number of trials required to face the first success. (iii)Apply Poisson distribution, multivariate Poisson distribution in estimating rare cases. (iv)Apply Hypergeometric distribution and its multivariate extention.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper VIII/Subject Name: Tensor Analysis		Subject Code: MAT014D308
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Tensor Analysis (MAT014D308)** are

- To enable learning special orthogonal coordinate systems.
- To provide information of Riemannian Geometry.
- To introduce the concepts of gradient, divergence and curl in higher dimension.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to 1.Describe behaviours of vector in different coordinate system. 2. Describe advantages and application of Riemannian Geometry. 3. Describe geodesic in n-dimensional Euclidean space.	(i) Each topic to be expounded with examples. (ii)Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v)Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper IX/Subject Name: Financial Mathematics		Subject Code: MAT014D309
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Financial Mathematics (MAT014D309)** are

- To make the student understand the basics of Financial Markets.
- To impart understanding the theory behind the Portfolio Management.
- To explore the application of probability spaces to define different aspects of financial market.
- To enable deriving discrete time and continuous time finance models.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • understand the basics of financial market • analyse risk management in financial market • apply the probabilistic theories in the discrete and continuous models of financial market. • derive and apply Black-Scholes-Merton (BSM)models.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv)Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (3rd SEMESTER)

Paper X/Subject Name: Seminar/Literature Survey		Subject Code: MAT014D331
L-T-P-C: 0-0-0-4	Credit Units: 4	Scheme of Evaluation:

Objective: The objectives of **Seminar /Literature Survey (MAT014D331)** are

- To develop student's ability to individual minor research
- To inculcate critical understanding of a topic relevant research interest
- To instil the ability of writing research report
- To develop the ability to communicate through presentation

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • Gather in depth knowledge in a topic of their choice in doing seminar/ Literature survey. • Develop oral and written presentation skills. • Develop a taste of research in various topics of Mathematics	(i) Students to be encouraged to take part in discussions and ask questions during seminar sessions. (ii) Students to be encouraged to select topics of their own interest. (iii) One to one interaction of Guide and students. (iv) Use of research Lab to learn word processing, PPT presentation skill or any other mathematical tools needed for the seminar	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)25 marks on • Skill Test • Quiz. (ii) Class attendance - 5 marks (c) SEE (70) Presentation • Report writing • Presentation Skill • Depth of minor research • Viva-voce .

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SYLLABUS (4thSEMESTER)		
Paper VIII/Subject Name: Measure Theory (25% Blended Mode)		**Subject Code: MAT014C401**
L-T-P-C: 4-0-0-4	**Credit Units: 4**	**Scheme of Evaluation: T**

Objective: The objectives of **Measure Theory (MAT014C401)** are

1. To introduce the concepts of measure and integral with respect to a measure
2. The enable the student tol develop specific skills of measure theory throughout the course to solve problems and for further study in the related fields.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will 1. Get the concept of Lebesgue measure and Measurable functions and related properties. 2. Get the knowledge of Lebesgue integral and acquainted with the proofs of the fundamental theorems underlying the theory of integration. 3. Get the concept of differentiation and integration in measure theory with important properties.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv)Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations. (vi) Module IV to be taught in blended mode as per above E-Reference.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • Class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper VIII/Subject Name: Dynamical System **Subject Code: MAT014C402**

L-T-P-C: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The general objectives of the course **Dynamical System (MAT014C402)** are

- To introduce the concept of dynamical system and vector fields
- To provide the concept of stability and equilibrium.
- To provide the methods for solution of nonlinear differential equations.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • Understand the fundamental concepts of the dynamical systems. • formulate a physical system to dynamical system model • find local and global stability of a dynamical system. • Know the importance of Poincare Bendixson's theorem. • Understand the importance of limit cycle. • learn to analyze non-linear systems described by maps and differential equations. • Know Fractal geometry	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper I/Subject Name: Algebra-II		Subject Code: MAT014D401
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **ALGEBRA II (MAT014D401)** are

- To provide the continuous approach to the subject of algebra, which is one of the basic pillars of modern mathematics and to inculcate in students the power of accurate analysis.
- To provide an insight for further study into applications of abstract algebra in certain areas by knowing to perform algorithms.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • Describe the theorems and properties of more abstract algebraic structures in groups, rings, fields. • Get the knowledge of linear transformations and canonical forms. • Apply course material along with techniques and procedures covered in this course to solve problems.	i) Each topic to be explainedwith examples. ii) Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. iii) Students to be given homework/assignments to make their concept clear.. iv) Discuss and solve the theoretical problems in the class.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper II/Subject Name: Fuzzy Set Theory (50% Blended Mode) **Subject Code: MAT014D402**

: 4-0-0-4 **Credit Units: 4** **Scheme of Evaluation: T**

Objective: The main objective of **Fuzzy Set theory (MAT014D402)** is

- To impart understanding the basic mathematical elements of the theory of fuzzy sets that are widely used in science and engineering.
- To provides the idea on the differences and similarities between fuzzy sets and classical sets theories.
- To make the student understand the fuzzy logic inference with emphasis on their use in the design of intelligent or humanistic systems.
- To introduce the fuzzy arithmetic concepts and provide an insight into fuzzy inference applications

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to • distinguish between the crisp set and fuzzy set concepts through the learned differences between the crisp set characteristic function and the fuzzy set membership function. • draw a parallelism between crisp set operations and fuzzy set operations through the use of characteristic and membership functions respectively. • define fuzzy sets using linguistic words and	i) Each topic to be explained with examples. ii) Students to be motivated to discover the relevant concepts to take part in discussions and ask questions. iii) Students to be given homework/assignments to make their concept clear.. iv) Discuss and solve the theoretical as well as real world problems in the class. v) Module III and IV to be taught in blended mode as per above E-Reference.	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.
represent these sets by membership functions. • know how to perform mapping of fuzzy sets by a function and also use the α-level sets in such instances. • know fuzzy-set-related notions: such as α-level sets, convexity, normality, support, etc.		

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SYLLABUS (4th SEMESTER)

Paper II/Subject Name: Operator Theory		Subject Code: MAT014D403
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Operator Theory (MAT014D403)** are

- To provide advantages of study of Banach algebras.
- To enable understanding spectral behavior of various bounded linear operators.
- To explain behavior of operators in C* algebras.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Describe basic notion of Banach algebras and its application in various operators. (ii) Describe spectral properties of various bounded linear operators. (iii) Describe spectral properties of self-adjoint operators. (iv) Describe basic notions of C*-algebras and its application in various operator.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations. (vi) Students to be motivated to apply the concepts in higher studies.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper IV/Subject Name: Theory of Relativity		Subject Code: MAT014D404
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Theory of Relativity (MAT014D404)** are

- To impart understanding the fundamental principles of the general theory of relativity.
- To enable developing the concepts like the equivalence principles, inertial frames and gravity.
- To introduce the concepts of static and non-static cosmological models.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Learn the fundamental concept of tensor calculus. 2. Understand the physical phenomena in different coordinate systems and to transform from one coordinate system to another. 3. Analyse the mathematical description of gravitational waves, as well as cosmological models in the context of general relativity. 4. Learn to solve Einstein's field equations for static spherically symmetric problems and for isotropic and homogeneous cosmological models.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations: 10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper IV/Subject Name: Fluid Dynamics		Subject Code: MAT014D405
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Fluid Dynamics (MAT014D405)** are

- To enable developing basic concept of fluid dynamics.
- To introduce the concepts and to explain fundamental laws of fluid dynamics.
- To enable developing problem solving skills to solve the fluid flow problems.
- To make the student understand the boundary layer theory.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1. Learn the basics of fluid dynamics. 2. Understand the governing equations of fluid motion and its role in fluid flow problems. 3. Analyze fluid flow problems with the application of the momentum and energy equations. 4. Learn to solve the problems of fluid flow with Navier Stokes Equations.	(i) Each topic to be explained with illustrations. (ii) Students to be involved in discussions and encouraged to ask questions (iii) Solve the theoretical and practical problems in the class. (iv) Students to be given homework/assignment. (v) Students to be encouraged to apply concepts to solve real world problems and do look for new applications.	(a) Participation in class discussions (b) Continuous Evaluation (30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations: 10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper VI/Subject Name: Number Theory-II		Subject Code: MAT014D406
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objectives of **Number Theory-II (MAT014D406)** are

- To impart the basic structure and properties of integers.
- To enable improving one's ability of mathematical thinking.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to 1. Identify numbers of special forms like , perfect number, Mersenne primes, Amicable numbers, Fermat number. 2. Represent integers as sum of squares. 3. Understand the concept of continued fraction and how number theory is used in continued fraction. 4. Learn algebraic numbers, number fields, algebraic integers, rings of integers, Quadratic fields. 5. Know the concept of partition of numbers, generating function.	(i) Each topic to be expounded with examples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in the class. (v) Students to be encouraged to give short presentations.	(a) Participation in class discussions (b) Continuous Evaluation(30Marks) (i) 15 marks on • Assignments • class tests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper VII/Subject Name: Bio-Mathematics		Subject Code: MAT014D407
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The main objective of **Bio-Mathematics (MAT014D407)** are

- To introduce the basic concepts of Mathematical modeling which is applicable in every physical system.
- To impart knowledge on theories and techniques of mathematical modeling in different biological systems
- To enable dealing with the formulation as well as stability analysis of the models.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i)Express various real world problems into a mathematical problem. (ii)Validate the models numerically. (iii) Study the stability of the system. (iv) Develop Delay model, Prey-predator model, epidemic model etc.	(i) Each topic to be expounded withexamples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in theclass. (v) Students to beencouraged to give shortpresentations.	(a)Participation in classdiscussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • classtests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper VIII/Subject Name: Multivariate Analysis-II		Subject Code: MAT014D408
L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: T

Objective: The objective of **Multivariate Analysis-II (MAT014D408)** is

- To impart understanding minimum knowledge of continuous probability distribution.
- To make the student understand and apply **Multivariate Analysis-II** to solve real value problems.

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
The students will be able to (i) Understand the continuous probability distribution, Cause and effect relation of multivariate distribution. (ii) Test the multivariate normal distribution and its confidence region. (iii) Apply the discriminant analysis in multivariate populations.	(i) Each topic to be expounded withexamples. (ii) Students to be motivated to take part in discussions and ask questions. (iii) Students to be given homework/assignments. (iv) Discuss and solve the theoretical problems in theclass. (v) Students to beencouraged to give shortpresentations.	(a)Participation in classdiscussions (b)Continuous Evaluation(30Marks) (i)15 marks on • Assignments • classtests. • viva-voce or presentation (ii) Mid-term examinations :10 marks (iii) Class attendance -5 marks (c) End-term examinations.-70 marks.

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SYLLABUS (4th SEMESTER)

Paper VIII/Subject Name: Major Project		Subject Code: MAT014D408
L-T-P-C: 0-0-0-12	Credit Units: 12	Scheme of Evaluation:

Objective: The objectives of **Major Project (MAT014D408)** are

- To develop student's ability to individual major research
- To inculcate critical understanding of a topic relevant research interest
- To instill the ability of writing research report
- To develop the ability to communicate through presentation

Facilitating the Achievement of Course Learning Outcomes

Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
• Learn about the ethical part of any research. • Learn how a choice of research and associated methodology relates to how a research problem is conceptualized. • Learn to develop critically understand the topic. • Learn to demonstrate the role of research, investigation and creative work in production of knowledge and meaning. • Learn to communicate through presentation • Learn how to write research reports	(i) One to one interaction of Guide and students (ii) Use of research Lab to learn word processing, PPT presentation skill or any other mathematical tools needed for the seminar .	(a)Participation in class discussions (b)Continuous Evaluation(30Marks) (i)25 marks on • Skill Test • Quiz. (ii) Class attendance - 5 marks (C) SEE (70) Presentation • Report writing • Presentation Skill • Depth of minor research • Viva-voce .

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES

(RSEES)

DEPARTMENT OF GEOGRAPHY

Learning Outcomes-based Curriculum Framework (LOCF) for Postgraduate Programme in the line of NEP, 2020

M.A/M.Sc. in Geography

The Assam Royal Global University
IQAC
Estd : 2016

Anuradha Devi
Director, IQAC
The Assam Royal Global University

M.A./M. Sc. Course in Geography: Semester-I

Paper I Core Course	GEOMORPHOLOGY			Subject Code: GEO164C 101
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The pivotal point of this course is to make students familiar with the fundamental concepts of geomorphology which incorporates the topics related to geomorphic structure and processes, earth's interior and composition, evolution of landforms and so on.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Recall** the principles, basic concepts of Geomorphology and its recent trends.

CO2. **Outline** the roles of structure, stage and time in shaping the landforms along with **interpreting** geomorphological maps.

CO3. **Apply** the knowledge in geographical research.

CO4. **Distinguish** between the mechanisms that control these processes and also **analyse** how the natural and anthropogenic operating factors affect the development of landforms.

CO5. **Evaluate** the functioning of Earth systems in real time.

Paper II Core Course	PRINCIPLES OF CLIMATOLOGY			Subject Code: GEO164C102
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to illustrate the atmospheric elements, processes and resultant weather and climates, the impact of climates on planet earth and its associated processes.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define** the elements of weather and climate and its impacts at different scales.

CO2. **Demonstrate and interpret** weather maps.

CO3. **Develop** the climatic aspects and its bearing on planet earth.

CO4. **Distinguish** world climatic regimes.

CO5. **Assess** the monsoon and its vagaries, global climate change and its consequences.

Paper III Core Course	GEOGRAPHY OF ECONOMIC ACTIVITIES			Subject Code: GEO164C102
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *It focuses on the basic concepts of economic geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define** concepts and ways on how geographical aspects organise economic space.

CO2. **Compare** different sectors of economy and arrive at logical conclusion regarding importance of each sector in economic development of the nation.

CO3. **Identify** the principles and significance of economic geography.

CO4. **Discover** new insights among students on the relevance of economy and geography and associated problems in contemporary times.

CO5. **Appraise** the regional variation in the economic scenario and distribution pattern of resources.

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Paper IV Core Course	GEOGRAPHY OF POPULATION AND SETTLEMENTS			Subject Code: GEO164C104
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Tell** about the basic definitions and concepts related to population geography and human settlements.

CO2. **Outline** the population parameters of India.

CO3. **Apply** and analyse the resultant impact of contemporary issues related to population on society and environment.

CO4. **Analyse** contemporary issues related to population dynamics and environment.

CO5. **Determine** clear exposition of spatial and structural characteristics of human settlements.

Paper V Core Course	PRACTICAL - I			Subject Code: GEO164C115
	L-T-P-C: 0-0-4-2	Credit Units: 4	Scheme of Evaluation: (P)	

Course Objectives: *The course aims at increasing the practical knowledge of the students.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define** the principles and concepts involved in Practical Geography.

CO2. **Classify** the nature, characteristics and sources of geospatial data.

CO3. **Develop** the skills and technical capabilities of the students.

CO4. **Simplify** the application of the concepts related to Geomorphology, Climatology and Population Geography.

CO5. **Inspect** geospatial tools and technologies to create and **analyse** geospatial data for natural resource assessments, planning and management related applications.

Paper, DSE - 1	AGRICULTURAL PRACTICES IN INDIA			Subject Code: GEO164D101
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make the students understand the role and place of agriculture in Indian Economy.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. Recall the definition, basic concepts and field of Agricultural Geography.

CO2. Apply the various indices associated with agriculture.

CO3. Develop the basic ideas related to geographical perspective of agriculture in India.

CO4. Analyse the fundamental processes associated with agricultural system of India.

CO5. Appraise the significance of agriculture in Indian economy.

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Paper, DSE - 2	ENVIRONMENT AND SUSTAINABLE DEVELOPMENT			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D102

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Relate** to basics of science of environmental change and sustainable development.

CO2. **Classify** different types of natural resources and its importance.

CO3. **Develop** understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.

CO4. **Inspect** upon the issues of adaptation and mitigation from hazards and management of solid wastes.

CO5. **Explain** the policies of development and environmental protection in developed and developing countries

M.A./M. Sc. Course in Geography: Semester-II

Paper I Core Course	GEOGRAPHY OF DEVELOPMENT OF INDIA			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C201

Course Objectives: *The course aims to define the regional basis of India and evaluate the basic ideas of the different aspects of India.*

Course Outcomes:

By the end of this course, the students will be able to:

CO1. **Define** the concepts involved in explaining India as a regional unit.

CO2. **Compare** and **interpret** the disparity that prevails among the different states of India.

CO3. **Build** knowledge on population structure, industrial aspects, transport and communication of the region.

CO4. **Analyse** various prospects of India.

CO5. **Examine** the position of India in global context.

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Paper II Core Course	SOIL AND BIOGEOGRAPHY			Subject Code: GEO164C202
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make students understand the fundamental concept of soil and biogeography under various categories.*

Course Outcomes:

By the end of this course, the students will be able to:

CO1. **Define** and understand the basic terms and concepts of soil and biogeography.

CO2. **Interpret** the important issues pertaining to environment.

CO3. **Construct** the basic properties, morphology and other properties associated with soil and biogeography.

CO4. **Analyse** independently the various biodiversity conservation and management issues.

CO5. **Evaluate** the regional basis and significance of Soil and Biogeography.

Paper III Core Course	BASICS OF GEOINFORMATICS			Subject Code: GEO164C203
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define** basic concepts of remote sensing.

CO2. **Interpret** principles and applications of various remote sensing techniques including aerial photography.

CO3. **Develop** the skills in integrating and analyzing spatial data.

CO4. **Analyse** this knowledge for land use land cover map preparation.

CO5. **Assess** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.

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Paper IV Core Course	CARTOGRAPHIC METHODS IN GEOGRAPHY			Subject Code: GEO164C204
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *This course focuses to make the students understand the science and art of map making along with clearing the basics of map and map scale and its varied types along with the diagrammatic representation of geographical data.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define** about map and its types, map scale and profile mapping.

CO2. **Interpret** different projection systems and digital mapping analysis.

CO3. **Construct** graphs/charts, cartograms and thematic maps based on socio-economic, cultural and climatic data.

CO4. **Conclude** the importance of maps for regional development and decision-making.

CO5. **Evaluate** different aspects of surveying and levelling using varied techniques and equipment.

Paper V Core Course	Practical II: PRACTICAL ON GEOINFORMATICS			Subject Code: GEO164C215
	L-T-P-C: 0-0-6-3	Credit Units: 4	Scheme of Evaluation: (P)	

Course Objectives: *It aims to give the idea of the importance of various surveying techniques in geographical study, the concepts regarding scale, map projections to suit map purposes and understand the field ethics and different tools of field study.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Recall** varied cartographic terms, terminologies and techniques.

CO2. **Construct** different types of projections.

CO3. **Develop** the skills in preparation of thematic maps at various levels.

CO4. **Analyze** GIS based maps and perform spatial analysis, classify remote sensing satellite based data and prepare large scale maps by using traditional surveying equipment and GPS survey.

CO5. **Assess** the multiple surveying techniques and its application.

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Paper, DSE - 1	REGIONAL DEVELOPMENT OF NORTHEAST INDIA AND ASSAM			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D201

Course Objectives: *The course aims to define the regional basis of Northeast India and Assam and evaluate the basic ideas of the position of Northeast India and Assam in the Indian context.*

Course Outcomes:

By the end of this course, the students will be able to:

CO1. **Define** the concepts involved in explaining North-East India as a regional unit.
CO2. **Compare** and interpret the disparity that prevails among the different states of northeast.
CO3. **Build** knowledge on population structure, industrial aspects, transport and communication of the region.
CO4. **Analyse** various prospects of northeast India and Assam.
CO5. **Examine** the basic idea of position of Northeast India and Assam in Indian context.

Paper, DSE - 2	GEOGRAPHY OF TOURISM			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D202

Course Objectives: *The course aims to make the students define the basic theme and concepts of tourism geography and interpret the geographical components of tourism.*

Course Outcomes:

By the end of this course the students will be able to:

CO1. **Define**the geographical aspects that organise economic space.
CO2. **Illustrate** the geographical aspects of tourism in an area.
CO3. **Develop** practical field knowledge about tourist places across India.
CO4. **Analyse** the knowledge gathered through field visits and prepare their respective reports.
CO5. **Justify** the methods of tourist flow in relation to the geographical setting of an area.

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M.A./M. Sc. Course in Geography: Semester-III

Paper I Core Course	RESEARCH METHODOLOGY			Subject Code: GEO164C301
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make the students understand the basics of qualitative and quantitative research, literature review, data collection, identification of research problem, formulate research objectives and research questions, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.*

Course Outcomes:
After the completion of course, the students will have ability to:

CO1. **Define** the concepts and tools of research.
CO2. **Infer** ideas that can be taken up for research work through literature review.
CO3. **Develop** hypothesis and research questions.
CO4. **Identify** appropriate data collection and sampling techniques.
CO5. **Interpret** the various types of data along with **critical evaluation**.
CO6. **Design and develop** a scientific research report

Paper II Core Course	QUANTITATIVE METHODS IN GEOGRAPHY			SubjectCode: GEO164C302
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *This paper provides an understanding of the pure and applied nature of Geography along with the key elements in the discipline.*

Course Outcomes:
After successful completion of the course, the students will be able to:

CO1. **Define** the statistical methods and quantitative techniques used in Geography.
CO2. **Interpret** various methods and techniques of data collection, data tabulation, data interpretation and analysis.
CO3. **Identify** the importance of data in geography.
CO4. **Analyse** data through tabulation, sample size and other methods by handling data in the field.
CO5. **Interpretation** of data and validation of hypothesis

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Paper III Core Course	MINOR PROJECT/ INTERNSHIP			Subject Code: GEO164C323
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	

Learning Objectives: *This paper provides an understanding the basics of research project preparation.*

Learning Outcomes:

After the completion of course, the students will have ability to:

CO1. **Relate** real world issues for carrying out research on a specific field
CO2. **Infer** ideas of research through literature review.
CO3. **Develop** hypothesis and research questions.
CO4. **Identify** appropriate sampling techniques.
CO5. **Interpret** the various types of data along with **critical evaluation**.
CO6. **Design and develop** a detail project report

Paper DSE - 1	REMOTE SENSING: PRINCIPLES AND APPLICATIONS			Subject Code: GEO164D301
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:

CO1. **Define** basic concepts of remote sensing.
CO2. **Explain** principles and applications of various remote sensing techniques including aerial photography.
CO3. **Utilize** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.
CO4. **Apply** this knowledge for land use land cover map preparation.
CO5. **Interpret** Geospatial data

Adv

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Paper DSE - 2	THEORETICAL BASIS OF REGIONAL PLANNING			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D302

Course Objectives: *This course intends to make the students* understand the concept of a region from a Geographic perspective and its ramifications in planning.

Course Outcomes:

After successful completion of the course, the students will be able to:

CO1. **Define** basic concepts of regional planning
CO2. **Explain** the strategic importance and applicability of planning in multi-level aspects
CO3. **Build** plans for development in rural and urban regions
CO4. **Apply** this knowledge in real world situations.
CO5. Interpret various issues related to regional planning on national and global perspective

Paper DSE - 3	PRINCIPLES OF AGRICULTURAL GEOGRAPHY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D303

Course Objectives: *The course tries to make the students understand the basic concepts of agricultural geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

After successful completion of the course, the students will be able to:

CO1. **Define** concepts of agricultural geography.
CO2. **Compare** different sectors of economy and arrive at logical conclusion regarding importance of agriculture sector in economic development of the nation.
CO3. **Identify** the principles and significance of agricultural geography.
CO4. **Discover** new insights on the relevance of agricultural geography and associated problems in contemporary times.

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Paper DSE - 4	GEOGRAPHY OF FOOD SECURITY OF INDIA			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D304

Learning Objectives:

- To make the students understand the principles associated with agriculture practices in India
- To develop the basic ideas of agricultural geography and its various implications

Learning Outcomes:

By the end of this course the students will be able to

- Understand the principles of agricultural geography
- Understand various concepts related to agricultural geography
- Understand the strategic importance and applicability of agricultural geography in India

M.A./M. Sc. Course in Geography: Semester-IV

Paper I Core Course	GEOGRAPHICAL THOUGHT			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C401

***Learning objective**: The objective of this course is to make the student look into the chronology of development of the subject of geography through contribution of varied scholars, approaches and schools, major themes and components of geography.*

Learning Outcomes:

CO 1. Define the various parameters and components of Geography.

CO 2. Interpret the chronological development of the subject of geography.

CO 3. Identify the contributions made by the schools of geography.

CO 4. Discover the physical and humanistic perspective and its dimensions in Geography in relation tothe physical and cultural surrounding

CO 5. Explain the various issues of real world with a geographical perspective

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Paper II Core Course	OCEANOGRAPHY AND HYDROLOGY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C402

Course Objectives: *The course aims to illustrate the atmospheric elements, the impact of climates on planet earth, the oceanic processes, ocean floor topography and marine resources.*

Course Outcomes:

After successful completion of the course, the students will be able to:

CO1. **Define** the elements of weather and climate and and its bearing on planet earth and the oceanic process and availability of resources.
CO2. **Demonstrate** the marine resources of the earth.
CO3. **Explain** the ocean configuration of the earth.
CO4. **Distinguish** between the different ocean reliefs.
CO5. **Determine** the various issues related to oceanic topography.

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Definition and scope of oceanography, growth and development of oceanography; oceanography and other sciences; distribution pattern of land and sea, Age and origin of oceans, and ocean morphology, Distribution of temperature, salinity, and density of oceans, origin of ocean basins : Wegner's drift hypothesis and sea floor spreading & Plate Tectonics.	12
Unit 2	Depth of ocean, hypsometric curve, ocean floor profile-continental shelf, slope, ridge & deeps, abyssal plains; submarine canyons; coral reefs-origin and distribution; ocean deposits; configuration of ocean floors of Indian and Atlantic Ocean	12
Unit 3	Temperature of oceans; salinity in oceans; density of oceans; dynamics of ocean currents; currents of Atlantic, Pacific and Indian Ocean; tides and waves; Tsunami Marine sediments and deposits, Food and mineral resources of the sea.	10
Unit 4	Hydrological cycle, Factors affecting the movement of water, Patterns of movement: Water Budget, World water Resources, World Water Balance, Global Freshwater Resources, History of Hydrology Watershed, Its Characteristics and Evaporation Process: Topographic and Effective Watershed, Physiographic characteristics of a Watershed-Geometric & Drainage Network	14
	Total	**48**

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Paper III Core Course	MAJOR PROJECT			Subject Code: GEO164C413
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (P)	

Learning Objectives: *The course aims to make the students understand how to approach a research problem and to formulate research objectives and research questions in proper perspective, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.*

Learning Outcomes:

After the completion of course, the students will have ability to:

CO7. **Choose** appropriate research methods for carrying out research on a specific field.
CO8. **Infer** ideas and **classify** the issues that needs attention for formulation of hyporthesis.
CO9. **Develop** hypothesis and research questions.
CO10. **Identify** appropriate sampling techniques.
CO11. **Interpret** the various types of data along with **critical evaluation.**
CO12. **Design and develop** a detail project report

Paper DSE-1	GIS AND GPS: PRINCIPLES AND APPLICATIONS			Subject Code: GEO164D401
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make the students interpret the data, tools and technology and applications of Geoinformatics - GIS, Remote Sensing and GPS and Construct and Analyse maps using Geospatial Technology (Geoinformatics)*

Course Outcomes:

After successful completion of the course, the students will be able to:

CO13. **Define** the fundamental terms and terminologies of Geoinformatics.
CO14. **Outline** the strength and application of Geospatial Technology.
CO15. **Build** map of the resources, their location and availability.
CO16. **Analyse** the different remote sensing data sets collected from various platforms.
CO17. **Interpret** Geospatial data in GIS platforms and perform analysis from various sources of data such as Remote Sensing and GPS for geographical research

Paper DSE-2	SOCIAL AND CULTURAL GEOGRAPHY			Subject Code: GEO164D402
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make students understand the basic concepts related to social and cultural geography in the geographical framework in the spatial context.*

Course Outcomes:

After successful completion of the course, the students will be able to:

CO1. **Define** the fundamental concepts of social and cultural dimensions.
CO2. **Interpret** the social and cultural concepts in a broader and analytical manner
CO3. **Build** knowledge on structures, formations of countries as well as on various schools of social and cultural geography
CO4. **Analyze** the socio-cultural in the geographical dimensions
CO5. **Perceive the** the issues related to socio-cultural aspects with a geographical perspective.

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Paper DSE-3	REGIONAL PLANNING IN INDIA AND SELECTED COUNTRIES			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D403

Course Objectives: *The course aims to provide knowledge on the development of Regional planning in India and impart the basic ideas related to regional planning ij India context and its implication with the south east Asian countries*

Course Outcomes:

After successful completion of the course, the students will be able to:

- CO1. **Define** the concepts involved in regional planning and its relevance in regional development
- CO2. Interpret the disparity that prevails among the different states of northeast
- CO3. **Compare** the geo-political relations of India with other countries.
- CO4. **Analyse** various prospects of development in India and south east Asian countries.
- CO5. **Explain the** population structure, industrial aspects, transport and communication of India and some selected countries.

Paper DSE-4	GLOBAL CLIMATE CHANGE			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D404

Course Objectives: *The course aims to give the idea of the concept of climate change and its impact on various aspects in global context, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

After successful completion of the course, the students will be able to:

- CO1. **Relate** to basics of Science of Climate Change.
- CO2. **Classify** different types of vulnerability.
- CO3. **Develop** understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health.
- CO4. **Inspect** upon the issues of adaptation and mitigation.
- CO5. **Recommend** suitable measure for mitigation of issues related to climate change.

Anuradha Dev

Director, IQAC
The Assam Royal Global University

ROYAL GLOBAL UNIVERSITY

GUWAHATI

(ROYAL SCHOOL OF MEDICAL & ALLIED SCIENCES)

(RSMAS)

DEPARTMENT OF PHYSIOTHERAPY

Learning Outcomes-based Curriculum Framework (LOCF)

Master of Physiotherapy

W.E.F 2022 - 23

The Assam Royal Global University IQAC Estd 2018

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Level -Semester I

Course: Core C1

Title of the Paper: PRINCIPLES OF PHYSIOTHERAPY PRACTICE
Subject Code: PHT244C201

Marks/ Credits: 100/4

L-T-P-C: 3-1-0-4 **Total credits: 4**

Course Objectives:

The objective of the course is to help students to understand the principles of physiotherapy profession, should be able to understand principles of management in personal management, time management and administration including budgeting and focuses on documentation.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the legal responsibility and professional culture	**BT 2**
CO 2	**Understand** the organization of principles and budget planning, Management and Administration	**BT 2**
CO 3	**Application**. Of Rules and Regulations of governing bodies while handling patients .	**BT 3**
CO 4	**Application** of scales according to condition and use of various assessment techniques'	**BT 4**

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Level: Semester I

Course: Core (C2)

Subject: Research Methodology & Biostatistics

Subject Code: PHT244C102

Total marks/ credits: 100 /4

L-T-P-C: 3-1-0-4 **Total credits: 4**

Course Objective:

The course objective is that after completion of this course the students will be able to
able to perform independent research within the department and help the department and the team for treatment planning of the patient.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the principles of research and biostatistics to health practice including the design and implementation of health-related research studies.	**BT 1**
CO 2	**Outline** processing and analysis of data.	**BT 2**
CO 3	**Plan and execute** a research study, including clinical trials.	**BT 3**
CO 4	**Undertake** independent research in the field of physiotherapy.	**BT 4**

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Level: Semester I

Course: Core (C3)

Subject: Biomechanics and Kinesiology

Subject Code: PHT244C103

Total marks/ credits: 100 /4

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objective: The course aims to allow the student to be able become prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures with an understanding of normal biomechanics and related patho-mechanics and provide adequate knowledge about the treatment procedures and its benefit.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** biomechanical terms , basic concepts of Physics incorporated to human motion.	**BT 1**
CO 2	**Apply** exercise physiology & principles of physiotherapy practice in planning various rehabilitation protocol.	**BT 3**
CO 3	**Plan and execute** treatment planning protocol, management, administration of physiotherapy treatment and provision of patient support.	**BT 3**
CO 4	**Undertake** independent research in the field of biomechanical analysis of normal and pathological motion for various activities of daily living and during sports.	**BT 4**

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Level : Semester I

Course: C (4)

Title of the Paper: LAB-I
Subject Code: PHT244C111

Marks/ Credits: 100/3

L-T-P-C : 0-0-3-3 **Total credits: 3**

Course Objectives:

- The objective of the course is to help students to understand how to identify the cause of movement dysfunction and focuses on assessment of balance and coordination, goniometry and exercise therapy principles.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of muscle and joint function and describe the use of various equipment's and techniques.	**BT 2**
CO 2	**Demonstrate** how to grade the strength of muscle and how to measure the joint range of motion.	**BT 3**
CO 3	**Demonstrate** the technique of different types of movements, massage therapy muscle training and fitness training concepts.	**BT 3**
CO 4	**Analyse** the problem of the patient and plan the treatment required based on problem of the patient.	**BT 4**

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Level: Semester I

Course: Core (C5)

Subject: Clinical Education- I

Subject Code: PHT244C112

Total marks/ credits: 100 /4

L-T-P-C : 0-0-2-2 **Total credits: 2**

Course Objective:

- Every enrolled student has to carry out clinical posting in various clinical establishment in and around Guwahati.
- To enable each student the practical exposure of the various clinical subjects taught and their applications in terms of patient communication and treatment.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various orthopaedic conditions and their symptomology to patients and management.	**BT 2**
CO 2	**Apply** the their skills to assess, evaluate, diagnose and manage different patients from different departments like orthopaedics, neurology, paediatrics.	**BT 3**
CO 3	**Construct** the framework for exercise therapy and electrotherapy protocols.	**BT 3**
CO 4	**Analyse** the pathology of the traumatic and non traumatic orthopaedic conditions and their various treatment protocols both medical and surgical aspects.	**BT 4**

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Level: Semester I

Course: DSE (D2)

Title of the Paper: DSE (YOGA & NATUROPATHY)

Subject Code: PHT244D102

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objectives

Introduction of Yoga & important streams, history, basis of different yoga. Elaborate type of treatment related to disease with Asanas & Pranayamas. Introduction to the importance & process of Naturopathy.

Course outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Learn** about the various definitions of Yoga, history of Yoga & branches of Yoga.	**BT 1**
CO 2	**Describe** various kinds of Yoga, Asanas & Pranayamas its importance, methods. Rules, regulations & limitations.	**BT 2**
CO 3	**Demonstrate** the various types of Yoga techniques in daily life.	**BT 3**
CO 4	**Apply** the knowledge of naturopathy in managing various diseases, by balance diet, therapeutic baths, power of colours.	**BT 3**

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Level: Semester -II

Course: C 1

Title of the Paper: EXERCISE PHYSIOLOGY
Subject Code: PHT244C201

Marks/ Credits: 100/4

L-T-P-C: 3-1-0-4 **Total credits: 4**

Course Objectives:

The objective of the course is to help students to understand the acute and chronic physiological changes that takes place with exercise in various systems of the body and also focuses on fitness assessment, formation of exercise prescription considering various factors.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the acute and chronic physiological changes that happen with exercise on various systems.	**BT 2**
CO 2	**Application** of the various protocols to assess the cardiorespiratory endurance and the principles of exercise prescription.	**BT 3**
CO 3	**Demonstrate** different methods of strength training, flexibility training and training of cardiorespiratory endurance.	**BT 3**
CO 4	**Analyse** the interpretation obtained from the tests and accordingly plan the exercise sessions.	**BT 4**

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Level: Semester II

Course: C-2

Title of the Paper: ELETRO PHYSIOLOGY

Subject Code: PHT244C202

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objectives

The objective of the course is to learn the physiological basis of EEG, EMG activity & able to describe the pattern & also able to identify normal, normal variants & abnormal patterns in adult & pediatric patients.

Course outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understanding** anatomy and physiology of peripheral nerve, muscle and neuromuscular junction & electrical properties of muscle and nerve.	BT 1
CO 2	**Explain** factors influencing learning including the learner & the environment, how these factors can be applied in clinical practice.	BT 2
CO 3	**Demonstrate** various electrophysiological tests & its application.	BT 3
CO 4	**Analyze** & synthesis research relating to a chosen topic to interpret electro diagnostic procedures.	BT 4

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Level: Semester -II

Course: C 3

Title of the Paper: PHYSICAL AND FUNCTIONAL DIAGNOSIS-I
Subject Code: PHT244C203

Marks/ Credits: 100/3

L-T-P-C: 2-1-0-3 **Total credits: 3**

Course Objectives:

The objective of the course is to help students to understand the examination of musculoskeletal, neurological, cardiac and pulmonary disorders, pathological investigations, screening methods ,fitness assessments and treatment techniques .

Course Outcomes:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the acute and chronic physiological changes that happen with exercise on various systems.	**BT 2**
CO 2	**Application** of the various protocols to assess the cardiorespiratory endurance and the principles of exercise prescription.	**BT 3**
CO 3	**Demonstrate** different methods of strength training, flexibility training and training of cardiorespiratory endurance.	**BT 3**
CO 4	**Analyse** the interpretation obtained from the tests and accordingly plan the exercise sessions.	**BT 4**

Adv

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Level: Semester II

Course: C-4

Title of the Paper: LAB II

Subject Code: PHT244C211

L-T-P-C:0-0-3-3 **Total credits: 3**

Course Objectives

The course is designed with an objective to give the students to acquire the in-depth knowledge of movement dysfunction of human body, cause thereof principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Explain and understand the** proficiency in creating awareness using newer technology, at various levels in community for healthcare & professional awareness.	BT 1
CO 2	**Understand the** planning and implementation of treatment programme adequately	BT 2
CO 3	**Demonstration** of theoretical knowledge in independent practice, on fields of sports and community and during disaster situation.	BT 3
CO 4	**Analyzing the** planning and implementation of treatment programme adequately and appropriately for all clinical conditions common as well as rare related to respective specialty in acute and chronic stage, in intensive care, indoor, outdoor and institutional care.	BT 3

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Level: Semester II

Course: Core (C5)

Subject: Clinical Education- II

Subject Code: PHT244C212

Total marks/ credits: 100 /4

L-T-P-C : 0-0-2-2 **Total credits: 2**

Course Objective:

- Every enrolled student has to carry out clinical posting in various clinical establishment in and around Guwahati.
- To enable each student the practical exposure of the various clinical subjects taught and their applications in terms of patient communication and treatment.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various orthopaedic conditions and their symptomology to patients and management.	**BT 2**
CO 2	**Apply** the their skills to assess, evaluate, diagnose and manage different patients from different departments like orthopaedics, neurology, paediatrics.	**BT 3**
CO 3	**Construct** the framework for exercise therapy and electrotherapy protocols.	**BT 3**
CO 4	**Analyse** the pathology of the traumatic and non traumatic orthopaedic conditions and their various treatment protocols both medical and surgical aspects.	**BT 4**

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Level :Semester III

Course: C 1

Title of the Paper: PHYSICAL AND FUNCTIONAL DIAGNOSIS-II
Subject Code: PHT244C301

Marks/ Credits: 100/3

L-T-P-C: 2-1-0-3 **Total credits: 3**

Course Objectives:

The objective of the course is to help students to understand the examination of musculoskeletal, neurological, cardiac and pulmonary disorders, pathological investigations, screening methods ,fitness assessments and treatment techniques .

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the acute and chronic physiological changes that happen with exercise on various systems.	**BT 2**
CO 2	**Application** of the various protocols to assess the cardiorespiratory endurance and the principles of exercise prescription.	**BT 3**
CO 3	**Demonstrate** different methods of strength training, flexibility training and training of cardiorespiratory endurance.	**BT 3**
CO 4	**Analyse** the interpretation obtained from the tests and accordingly plan the exercise sessions.	**BT 4**

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Level :Semester III

Course: C 2

Title of the Paper: Physiotherapeutics

Subject Code: PHT244C303

Marks/ Credits: 100/3

L-T-P-C: 2-1-0-3 **Total credits: 3**

Course Objectives:

Course is designed with the following major objectives, student should be able to execute all routine physiotherapeutic procedures with evidence based practice and perform independent physiotherapy assessment and treatment for patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the pathophysiology of various cardio respiratory disorders	**BT 2**
CO 2	**Understand** importance of various investigations to differentially diagnose	**BT 2**
CO 3	**Application** of the different techniques to assess the cardio respiratory dysfunction	**BT 3**
CO 4	**Analyse** and plan the treatment goals based on presentation of the condition.	**BT 4**

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LEVEL: 3rd SEMESTER

Course: C 4

Title of the Paper: LAB-III
Subject Code: PHT244C311

Marks/ Credits: 100/3

L-T-P-C : 0-0-2-2 **Total credits: 2**

Course Objectives:

- The objective of the course is to help students to understand how to identify the cause of movement dysfunction and focuses on assessment techniques and treatment techniques.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the assessment of	BT 2
CO 2	**Demonstrate**	BT 3
CO 3	**Demonstrate** the technique of different types of movements, massage therapy muscle training and fitness training concepts.	BT 3
CO 4	**Analyse** the problem of the patient and plan the treatment required based on problem of the patient.	BT 4

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Level: Semester III

Course: Core (C5)

Subject: Clinical Education- III

Subject Code: PHT244C312

Total marks/ credits: 100 /4

L-T-P-C : 0-0-2-2 **Total credits: 2**

Course Objective:

- Every enrolled student has to carry out clinical posting in various clinical establishment in and around Guwahati.
- To enable each student the practical exposure of the various clinical subjects taught and their applications in terms of patient communication and treatment.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various orthopaedic conditions and their symptomology to patients and management.	**BT 2**
CO 2	**Apply** the their skills to assess, evaluate, diagnose and manage different patients from different departments like orthopaedics, neurology, paediatrics.	**BT 3**
CO 3	**Construct** the framework for exercise therapy and electrotherapy protocols.	**BT 3**
CO 4	**Analyse** the pathology of the traumatic and non traumatic orthopaedic conditions and their various treatment protocols both medical and surgical aspects.	**BT 4**

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Level: Semester 3

Course: DSE(D 1)

Title of the Paper: MUSCULOSKELETAL DISORDERS & SPORTS-I

Subject Code: PHT244D301

L-T-P-C:4-0-0-4 **Total credits: 4**

Course Objectives: Student should be able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures, able to provide adequate knowledge about the treatment procedures and its benefit and perform independent physiotherapy assessment and treatment for patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Explain** the terms	**BT 1**
CO 2	**Demonstrate** skill in Physical & Functional diagnosis of cases.	**BT 2**
CO 3	**Apply** techniques ertaining to patient under his/her care and demonstrate the ability to critically appraise recent physiotherapeutic and related literature from journals.	**BT 3**
CO 4	**Adopt** diagnostic & therapeutic procedures based on recent advancement in the field of rehabilitation.	**BT 3**

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Level: Semester III

Course: DSE(D2)

Subject: Adult Neurology I

Subject Code: PHT244D302

Total marks/ credits: 100 /4

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objective:

The course objective is that after completion of this course the students will be able to acquire skill in physical & functional diagnosis pertaining to patient with neurological disorders under his/her care & able to provide adequate knowledge about the treatment procedures and its benefit and perform independent physiotherapy assessment and treatment for patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Recall** anatomical & physiological basis of nervous system & **outline** the signs, symptoms and co-existing problems of patients with neurological dysfunction	BT 1 & 2
CO 2	**Apply** knowledge of biomechanics and patho- mechanics of joints in gait and posture in neurological condition	BT 3
CO 3	**Utilize** theories of Motor Control and Motor Learning in Neurorehabilitation.	BT 3
CO 4	**Analyze** various treatment approaches & advanced electro diagnosis and its applicability to various pediatric and adult neurological conditions	BT 4

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Level Semester -III

Course : DSE(D3)

Title of the Paper: CARDIO RESPIRATORY DISORDERS AND REHABILLITATION-I

Subject Code: PHT244D403

Marks/ Credits: 100/4

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objectives:

- The objective of the course is to help students to identify cardio respiratory dysfunction through assessment and investigations and demonstrate all the techniques required to restore the cardio respiratory function.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the pathophysiology of various cardio respiratory disorders	**BT 2**
CO 2	**Understand** importance of various investigations to differentially diagnose	**BT 2**
CO 3	**Application** of the different techniques to assess the cardio respiratory dysfunction	**BT 3**
CO 4	**Analyse** and plan the treatment goals based on presentation of the condition.	**BT 4**

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Level: Semester 3

Course: DSE (D4)

Title of the Paper: ORTHOTICS AND PROSTHETICS

Subject Code: PHT244D303

L-T-P-C:4-0-0-4 **Total credits: 4**

Course Objectives

Designed to assess the students to acquire the understanding of the normal physiology of human body and understand the alteration in the physiology for the fabrication of the prosthesis and orthosis.

Course Outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** the terms and the physiology for the fabrication of the prosthesis and orthosis.	**BT 1**
CO 2	**Understand** the nomenclature—the naming of orthoses and prostheses in relation to the joint they support or replace.	**BT 2**
CO 3	**Apply and obtain basic understanding of materials.**	**BT 3**
CO 4	**Analyzing** Understanding primarily with the **rehabilitation of people with locomotive or neuromuscular disorders.**	**BT 3**

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Level :Semester IV

Course: C 1

Title of the Paper: Advanced Therapeutics

Subject Code: PHT244C401

Marks/ Credits: 100/3

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objective:
At the completion of this course, the student should be able to execute all routine physiotherapeutic procedures with evidence based practice and perform independent physiotherapy assessment and treatment for patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of rehabilitation following multiple which includes orthopaedic, neurological , cardiorespiratory conditions and postsurgical cases.	**BT 2**
CO 2	**Demonstrate** planning and implementation of treatment programme adequately and appropriately for all clinical conditions.	**BT 2**
CO 3	**Application** of the various advanced physiotherapy techniques and modalities in different conditions.	**BT 3**
CO 4	**Analyse** the recovery process of various conditions through applications of advanced physiotherapy techniques.	**BT 4**

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Level :Semester IV

Course: C 2

Title of the Paper: Dissertation

Subject Code: PHT244C421

Marks/ Credits: 100/3

L-T-P-C: 0-0-3-3 **Total credits: 3**

Course Objective :

Every candidate shall submit to the Registrar (Academic) of the university in the prescribed dissertation work on or before the dates notified by the university.

Course Outcome:

After completion of the course, the students are expected that:

- Every candidate pursuing MPT course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher with relevant speciality.
- The result of such a work shall be submitted in the form of dissertation (in the fourth semester).

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Level :Semester IV

Course: C 3

Title of the Paper: Lab IV

Subject Code: PHT244C411

Marks/ Credits: 100/3

L-T-P-C : 2-1-0-3 **Total credits: 3**

Course Objective:

- The course is designed with an objective to give the student acquiring skill and the in-depth knowledge of movement dysfunction of human body.
- Principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy .

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts of rehabilitation following orthopaedic conditions and postsurgical cases.	**BT 2**
CO 2	**Demonstrate** neuro physiotherapeutic techniques pertaining to the condition.	**BT 2**
CO 3	**Application** of the various cardiorespiratory techniques in different medical set ups.	**BT 3**
CO 4	**Analyse** the recovery process of various conditions through applications of advanced physiotherapy techniques.	**BT 4**

Director, NAHS
The Assam Royal Global University

Level: Semester IV

Course: Core (C4)

Subject: Clinical Education- IV

Subject Code: PHT244C412

Total marks/ credits: 100 /4

L-T-P-C : 0-0-2-2 **Total credits: 2**

Course Objective:

- Every enrolled student has to carry out clinical posting in various clinical establishment in and around Guwahati.
- To enable each student the practical exposure of the various clinical subjects taught and their applications in terms of patient communication and treatment.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Explain** various orthopaedic conditions and their symptomology to patients and management.	**BT 2**
CO 2	**Apply** the their skills to assess, evaluate, diagnose and manage different patients from different departments like orthopaedics, neurology, paediatrics.	**BT 3**
CO 3	**Construct** the framework for exercise therapy and electrotherapy protocols.	**BT 3**
CO 4	**Analyse** the pathology of the traumatic and non traumatic orthopaedic conditions and their various treatment protocols both medical and surgical aspects.	**BT 4**

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Level: Semester IV

Course: DSE(D1)

Subject: Musculoskeletal Disorders and Sports II

Subject Code: PHT244D401

Total marks/ credits: 100 /4

L-T-P-C: 3-1-0-4 **Total credits: 4**

Course Objective:

This subject aims to enable student to become a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures, able to provide adequate knowledge about the treatment procedures and its benefit and perform independent physiotherapy assessment and treatment for patients.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Label** a client with Orthopedic condition with detailed knowledge regarding approaches for various Musculoskeletal injury assessment and management.	**BT 1**
CO 2	**Explain** the concepts related to outcome measures & disability evaluation in musculoskeletal disorders	**BT 2**
CO 3	**Plan** short- and long-term goals for Physiotherapy treatment to enhance functional abilities, improve mobility, posture, strengthen muscles, enhance wound/operative scar healing, relieve pain, musculoskeletal facilitation, re-education and training of muscle strength, endurance & motor control, posture and gait through skillful use of various therapeutic exercise technique	**BT 3**
CO 4	**Test for** clinical skills relevant to recent advances in Physiotherapy treatment techniques pertinent to musculoskeletal disorders and sports injuries.	**BT 4**

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Level: Semester IV

Course: DSE(D2)

Subject: Adult Neurology II

Subject Code: PHT244D402

Total marks/ credits: 100 /4

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objective:

The course objective is that after completion of this course the students will be able to treat all the neurological conditions which need physiotherapeutic procedures & critically appraise recent physiotherapeutic and related literature from journals & adopt diagnostic & therapeutic procedures based on it.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Label** a client with Neurological condition with detailed knowledge regarding approaches for various adult neurological assessment and management	**BT 1**
CO 2	**Explain** the concepts related to outcome measures & disability evaluation	**BT 2**
CO 3	**Plan** short- and long-term goals for Physiotherapy treatment to enhance functional abilities, improve mobility, posture, strengthen muscles, enhance wound/operative scar healing, relieve pain, musculoskeletal facilitation, re-education and training of muscle strength, endurance & motor control, posture and gait through skillful use of various therapeutic exercise technique	**BT 3**
CO 4	**Test for** clinical skills relevant to recent advances in Physiotherapy treatment techniques pertinent to adult & pediatric neurological disorders.	**BT 4**

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LEVEL: 4TH SEMESTER

Course : DSE(D3)

Title of the Paper: CARDIO RESPIRATORY DISORDERS AND REHABILLITATION-II

Subject Code: PHT244D403

Marks/ Credits: 100/4

L-T-P-C :3-1-0-4 **Total credits: 4**

Course Objectives:

- The objective of the course is to help students to identify cardio respiratory dysfunction through assessment and investigations and demonstrate all the techniques required to restore the cardio respiratory function.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the pathophysiology of various cardio respiratory disorders and importance of various investigations to differentially diagnose	**BT 2**
CO 2	**Application** of the different techniques to assess the cardio respiratory dysfunction.	**BT 2**
CO 3	**Application** of the different techniques for treatment of the cardio respiratory dysfunction.	**BT 3**
CO 4	**Analyse** and plan the treatment goals based on presentation of the condition.	**BT 4**

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Level: Semester IV

Course: DSE D4

Title of the Paper: DSE (COMMUNITY MEDICINE)

Subject Code: PHT244D404

L-T-P-C: 3-1-0-4 **Total credits: 4**

Course Objectives

The objective of the course is to understand the influence of social and environmental factors of individual and society. Various aspects of health & disease list the methods of health administration, health education & disease preventive measures.

Course outcomes

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the effects of the environment and the community dynamics on the health of the individual.	BT 1
CO 2	**Categorize** the various national health schemes and its benefits.	BT 2
CO 3	**Explain** about communicable and non communicable diseases and its implications.	BT 3
CO 4	**Apply** the knowledge to recognize the common health problems including their physical, emotional and social aspects at the individual, family and community levels and deal with public health emergencies.	BT 3

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Level : Semester IV

Course: DSE D5

Title of the Paper: Exercise Planning and Prescription in various conditions

Subject Code: PHT242D405

Marks/ Credits: 100/4

L-T-P-C : 3-1-0-4 **Total credits: 4**

Course Objectives:

- The objective of the course is to help students to understand the principles of fitness assessment and prescribe exercises considering the baseline condition of the patient.

Course Outcomes:

On successful completion of the course the students will be able to:		
Sl No	Course Outcome	Blooms Taxonomy Level
CO 1	**Understand** the principles of exercise prescription.	BT 2
CO 2	**Application** of the various protocols to assess the cardiorespiratory endurance.	BT 3
CO 3	**Demonstrate** different methods of strength training, flexibility training and training of cardiorespiratory endurance .	BT 3
CO 4	**Analyse** the interpretation obtained from the tests and accordingly plan the exercise sessions.	BT 4

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ROYAL GLOBAL UNIVERSITY
GUWAHATI

NAME OF THE SCHOOL

(RSHSS)

SYLLABUS

&

COURSE STRUCTURE

M. A. in Sociology

The Assam Royal Global University
IQAC
Estd : 2018

Anuradha Devi

Director, IQAC
The Assam Royal Global University

SYLLABUS (1st SEMESTER)

Paper I: Classical Sociological Tradition

Subject Code: SOC184C101

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To acquaint students with the writings of four thinkers, viz. Karl Marx, Emile Durkheim, Max Weber and Vilfredo Pareto, which would equip the students with theoretical insights to know, analyse and interpret the social scenario around them
- To enable students to critically analyse the writing of these four thinkers and also to familiarize them with the different sociological perspectives and theories.

Course Outcomes:

The student will:

- Acquaint students with the writings of four thinkers, viz. Karl Marx, Emile Durkheim, Max Weber and Vilfredo Pareto, which would equip the students with theoretical insights to know, analyse and interpret the social scenario around them
- Be able to critically analyse the writing of these four thinkers and also to familiarize them with the different sociological perspectives and theories.

Paper II: Theoretical Perspectives in Sociology

Subject Code: SOC184C102

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To introduce the students to the substantive, theoretical and methodological issues which have shaped the sociological thinking in the latter half of the 20th century, and which continue to concern the practitioners of sociology today.
- To examine the theoretical relevance and analytical utility of the premises, methodology and conclusions of these diverse theoretical perspectives in understanding social structure and change.

Course Outcomes:

The student will:

- Get introduced to the substantive, theoretical and methodological issues which have shaped the sociological thinking in the latter half of the 20th century, and which continue to concern the practitioners of sociology today.
- Be able to examine the theoretical relevance and analytical utility of the premises, methodology and conclusions of these diverse theoretical perspectives in understanding social structure and change.

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Paper III: Methodology of Social Research

Subject Code: SOC184C103

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To provide students exposure to the fundamentals of various research techniques and methods (both quantitative and qualitative).
- To sensitize post-graduate students to develop a critical outlook at the existing perspectives and methods and to evolve conceptual clarity that can lead them in their future research.
- To have exposure to certain quantitative methods, statistical techniques and qualitative methods to collect and analyze the data would help them organize and analyse the information gathered by them.

Course Outcomes:

The student will:

- Have exposure to the fundamentals of various research techniques and methods (both quantitative and qualitative).
- Be sensitized to develop a critical outlook at the existing perspectives and methods and to evolve conceptual clarity that can lead them in their future research.
- Have exposure to certain quantitative methods, statistical techniques and qualitative methods to collect and analyse the data would help them organize and analyse the information gathered by them.

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Paper IV: Perspectives of Indian Society

Subject Code: SOC184C104

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To make students acquire a fairly adequate and comprehensive understanding of Indian society in all its multi-faceted dimensions at the graduate level.
- To sensitize students to the diversity as well as inter-connectedness of theoretical perspectives on Indian society, thereby adding depth as well as insight to their understanding of the subject.

Course Outcomes:

The student will:

- Acquire a fairly adequate and comprehensive understanding of Indian society in all its multi-faceted dimensions at the graduate level.
- Get sensitized to the diversity as well as inter-connectedness of theoretical perspectives on Indian society, thereby adding depth as well as insight to their understanding of the subject.

SYLLABUS (2nd SEMESTER)

Paper I: Kinship Dynamics

Subject Code: SOC184C201

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- This course introduces the students to the universally acknowledged social importance of family and kinship.
- This course will familiarise the students with different approaches, issues and debates in studies of family and kinship which will enable the student to understand the social structure of different societies.
- This course will also look at the changing contemporary nature of family and kinship relation in the modern world.
- Throughout the course, examples will be drawn from northeast India.

Course Outcomes:

The student will:

1. Have conceptual and theoretical understanding of kinship as it has emerged in sociological literature.

2. Be able to address in particular the North East experience of kinship and change.

Adv

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Paper II: Society and Polity

Subject Code: SOC184C202

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

objectives of the course are-

- This course aims to acquaint the students with the major concepts, theoretical approaches and perspectives of political sociology.
- It seeks to prepare the students to apply these concepts and approaches to the understanding of the nature of the political processes and institutions in India.
- The course also exposes the students to the emerging perspective on the polity-society relationship in contemporary times.

Course Outcomes:

The student will:

- be acquainted with the major concepts, theoretical approaches and perspectives of political sociology. It will prepare the students to apply these concepts and approaches to the understanding of the nature of the political processes and institutions in India.

Paper IV: Gender and Society

Subject Code: SOC184C204

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To trace the evolution of gender as a category of social analysis in the late twentieth century.
- To give students an outline of the major debates that has emerged.
- To give students a better understanding of the social phenomena with reference to Gender.

Course Outcomes:

The student will:

- Be able to trace the evolution of gender as a category of social analysis in the late twentieth century.
- Have an outline of the major debates that has emerged.
- Have a better understanding of the social phenomena with reference to Gender.

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ELECTIVES (DSE 1 & 2)

Option 1: Sociology of South Asia

Subject Code: SOC184D101

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To expose the student to the strategic importance of South Asia as a civilizational centre as well as a player in international affairs and to acquaint her/him with the social cultural, economic, religious and political similarities and differences between the countries of the region.
- To acquaint students with the processes which have shaped the emergence of nation states in the region, the play of ethnic, regional and religious identities and conflicts in this process, and the different paths to socio-economic development and modernization adopted by the countries of the region.

Course Outcomes:

The student will:

- Get exposed to the strategic importance of South Asia as a civilizational centre as well as a player in international affairs and to acquaint her/him with the social cultural, economic, religious and political similarities and differences between the countries of the region.
- Be acquainted with the processes which have shaped the emergence of nation states in the region, the play of ethnic, regional and religious identities and conflicts in this process, and the different paths to socio-economic development and modernization adopted by the countries of the region.

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Option 2: Rural Society in India

Subject Code: SOC184D102
Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To provide sociological understanding of rural social structure, change and development in India.
- To impart sociological skills to reconstruct rural institution and rural development programmes to plan, monitor and evaluate rural development programmes.
- To acquaint students with the prevailing two approaches to the study of rural society: Rural community and peasantry.

Course Outcomes:

The student will:

- Have sociological understanding of rural social structure, change and development in India.
- Be able to impart sociological skills to reconstruct rural institution and rural development programmes to plan, monitor and evaluate rural development programmes.
- Be acquainted with the prevailing two approaches to the study of rural society: Rural community and peasantry.

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Option 3: Sociology of Information Society

Subject Code: SOC184D103

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To enable students to explore the rapid and profound social, economic cultural and political changes that we have witnessed over the past decades due to the advent of information technology revolution.
- To acquaint students with the role of technology in shaping social structures and institutions, social life and relationships and understanding of self and others.

Course Outcomes:

The student will:

- Be able to explore the rapid and profound social, economic cultural and political changes that we have witnessed over the past decades due to the advent of information technology revolution.
- Be acquainted with the role of technology in shaping social structures and institutions, social life and relationships and understanding of self and others.

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Option 3: Science, Technology and Society

Subject Code: SOC184D203

Credit Units: (L-T-P-C): 4-0-0-4

Evaluation of Students:

- **Continuous Evaluation:** Assignments, Class Tests, Quizzes, Seminar – 10%
- **Mid-term examination:** 20%
- **End term examination:** 70 %

The objectives of the course are-

- To enable the student to understand the relationship between science and Society.
- To introduce the student to the conceptual and theoretical issues in the study of sociology of science.
- To understand the issues relating to science, technology and society in India both in the Historical and Globalization contexts.

Course Outcomes:

The student will:

- Be able to understand the relationship between science and Society.
- Be introduced to the conceptual and theoretical issues in the study of sociology of science.
- Understand the issues relating to science, technology and society in India both in the Historical and Globalization contexts.

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