ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF MEDICAL AND ALLIED SCIENCES
(RSMAS)

DEPARTMENT OF OPERATION THEATRE TECHNOLOGY

LEARNING OUTCOME FOR CIRRICULUM FRAMEWORK (LOCF)
FOR UNDERGRADUATE PROGRAMME IN

Bachelor of Science in Operation Theatre Technology
(B.Sc. OTT)

W.E.F AY 2022- 2023

TABLE OF CONTENTS:

1. PREAMBLE

Operation Theatre Technology is a branch of paramedical science which deals with different aspects related to surgery performed at the operation theatre. Those who have expertise of this technology are called Operation Theatre Technicians. Institutes offer various diploma and degree courses in the Operation Theatre Technology which make candidates learn the skill of this field. The courses in Operation Theatre Technology intend to impart through knowledge of this field so that these professionals can help experts performing various procedures smoothly. These technicians are in great demand in surgery unit, emergency departments, and various intensive care units at hospitals.

At present, in our country very few universities are generating health professionals specialized in OT technology. The OT Technology Program introduced by Royal School of Medical and Allied Sciences, The Assam Royal Global University promises to generate OT professionals having extensive and elaborate knowledge in the fields of OT technology, both in theory and practical.

As operation theatre is available in nearly every hospital nowadays, these professionals are in high demand. Graduates in Operation Theatre Technology are easily recruited as assistant to Surgeons and Anaesthesiologists in surgical units in various departments.

As these professionals have expertise in managing different tasks at the operation theatre, the field offers a bright career prospect to students. Not only they assist doctors during operation with their technical knowledge of different tools and equipment, but they also help patients in post operation recovery.

Those who want to make career in this field should have certain skill sets apart from the degree they hold that include compassionate, disciplined, accountable, and team player. Accountability must be there among such professionals as operation is life saving act and there is no scope of mistake and negligence in operation theatre.

2. INTRODUCTION

Operation Theatre Technology professionals have sound knowledge of different procedures and play a crucial role in providing quality care to patients in the operation theatre. Operation Theatre Technicians work closely with the operation unit comprising surgeon, nurse, and anesthesiologist. Their main function is to manage the operation theatre during and after procedures, including looking after all the surgical instruments, their sterilisation, and preparation of operation theatre table. They ensure availability of various tools and equipment required for the surgery and ensures team never gets short supply in the case of emergency. They assist the operation team at both sterile and non sterile area.

Operation Theatre Technology is a paramedical field which deals with assistance and preparation of the Operation Theatre. An operation theatre (OT) technologist forms an intrinsic part of any hospital. He / she is a member of a multidisciplinary team in operation theatres who plays an active role in smooth functioning of operation theatre. He / she assist anaesthesiologist and surgical team during perioperative period and provide support to patients. He / she play an important role in advance preparation of equipments that are necessary for various anaesthesia / surgical procedures. He/she also looks after all the work and management of the OT which includes managing the patients in & out of operation theatre, care and maintenance of all the OT equipments as well as management of the staff.

As the surgical branch has various subspecialties including General Surgery, Eye, ENT, OBG, Cardiac, Ortho, genito-urinary, neuro and reconstructive surgeries, the OT technologist needs to know about these various subspecialties. Moreover, a variety of electrical and electronic equipments are in use in modern operation theatres for monitoring anaesthesia & surgical procedures. The success of the procedures and safety of patients depend largely on the reliability, smooth and trouble free performance of these equipments and ability of skilled manpower to operate the same. Thus, there is increased need for

qualified and trained OT Technologists not only in India, but also in other developing countries. This course is aimed at satisfying this need.

B.Sc. Operation Theatre Technology is a four-year undergraduate course including one-year compulsory internship in the field of health science. These medical professionals are an important part of the operation unit team who work alongside with the surgeon, anaesthesiologist and nurse in order to provide quality patient care throughout the surgery. These technicians make sure that every process in the operation theatre is as secure and safe meeting to students. Their prime duty is to take care of all the work and management of the operation theatre which comprise looking after all the surgical instruments, their sterilization, preparation of dressing table, operation theatre table, instrument table as well as anaesthesia table. They also look after the drugs necessary for surgery, anaesthetic gases, drapes and all the linen and their sterilization.

Apart from the fundamental educational requirement, outstanding scientific skills, communication skills and behavioural skills are necessary for surgical technologists. An eye for detail, accuracy and critical thinking is a must. Team work is essential as this job necessitate the person to work in partnership with other healthcare providers. Other prerequisites necessary are optimistic attitude, compassion and high levels of endurance and dedication. They must have the aptitude to work under minimal regulation, unpredictable shifts and long hours and must remain alert during operations.

3. LEARNING OUTCOME FOR THE CIRRICULUM FRAMEWORK (LOCF)

Learning Outcomes for Curriculum Framework i.e., LOCF is an initiative step introduced by UGC (University Grants Commission) to make the teaching-learning framework better and also to enhance the learning outcomes for students. The idea behind the implementation of LOCF is to pre-determine the outcomes that need to be achieved by planning, mapping and measuring the student outcome. According to LOCF, the curriculum will be designed by the faculty of the respective courses which would help the students to learn about the subjects of their interest while simultaneously mapping their progress at progress with each step. The student learning outcomes would be defined in terms of knowledge, skills, understanding, graduate attributes, values and employability. The need for LOCF is to improve students' passion for learning new skills and adopting an innovative mindset. The aim of LOCF is to enhance the quality of higher education in India and encourage the students to gain the best skills and knowledge during their student journey. The learning cycle of the LOCF can be divided in three phases which is planning, execution and attainment phase, and the outcomes are set at three levels i.e. Course outcome (COs), Program outcomes (POs) and Program specific Outcome (PSOs).

4. GRADUATE ATTRIBUTES:

Attribute	Description
Professional knowledge	Demonstrate scientific knowledge and understanding to work as a health care professional.
Technical	Demonstrate technical in order to implement the preventive, assessment and management plans for quality health care services.
Communication	Ability to communicate effectively and appropriately in writing and oral to patients/clients, care givers, other health professionals and other members of the community.
Cooperation/Team work	Ability to work effectively and respectfully with interdisciplinary team members to achieve coordinated, high quality health care.
Professional ethics	Ability to identify ethical issues and apply the ethical values in the professional life.
Research/ Innovation skills	A sense of inquiry and investigation for raising relevant and contemporary questions, synthesizing and articulating.
Critical thinking and problem solving	Ability to think critically and apply once learning to real life situations.
Reflective thinking	Ability to employ reflective thinking along with the ability to create the sense of awareness of one self and society.
Multi- cultural competence	Ability to effectively engage in a multicultural society and interact respectfully.
Leadership readiness/ qualities	Ability to respond in an autonomous and confident manner to planned and uncertain situations and should be able to manage themselves and others effectively.
Lifelong learning	Every graduate to be converted into lifelong learner and consistently update himself or herself with current knowledge/ skill and technologies. Acquiring knowledge and creating the understanding in learners that learning will continue throughout life.

5. Programme Learning Outcomes in B.Sc. Operation Theatre Technology

Program Outcomes (PO)

PO1: Professional knowledge

Understand and demonstrate scientific knowledge to work as a health care professional in the Operation Theatre.

PO2: Technical

Demonstrate and solve technical complexities and to implement the preventive, assessment and management plans for quality health care services.

PO3: Communication

Practice soft skill and good communicating skills to effectively and appropriately communicate with the patients, clients, co workers and other health professionals with the OT, hospital and the community.

PO4: Cooperation/Team work

Ability to work effectively and respectfully with interdisciplinary team members to achieve coordinated, high quality health care.

PO5: Professional ethics

Ability to identify ethical issues and apply the ethical values in the professional life and abide by the law and ethics followed in the OT and health care industry.

PO6: Research/ Innovation skills

A sense of inquiry and investigation for raising relevant and contemporary questions, synthesizing and articulating.

PO7: Critical thinking and problem solving

Ability to think and act in stressful situation and apply the knowledge in emergency real life circumstances.

PO8: Reflective thinking

Ability to employ reflective thinking along with the ability to create the sense of awareness of one self and society.

PO9: Multi- cultural competence

Ability to effectively engage in a multicultural society and interact respectfully.

PO10: Leadership readiness/ qualities

Ability to respond in an autonomous and confident manner to planned and uncertain situations and should be able to manage themselves and others effectively.

PO11: Lifelong learning

Every graduate to be converted into lifelong learner and consistently update himself or herself with current knowledge/ skill and technologies. Acquiring knowledge and creating the understanding in learners that learning will continue throughout life.

6. Programme Specific Outcomes

PSO 1: Students will be competent to work in various Operation Theatres. Students will understand the importance of the various departments of the hospital and their contribution to the well being of a patient.

PSO 2: Students will acquire in-depth knowledge of Anesthesia, Surgery, Critical care and pain Management. Students will be skilled in problem solving, critical thinking and will be able to assist the Surgeon or Anesthetist.

PSO 3: This Program will create a great source of manpower which can aid in our health sector especially in Operation Theatres. Students will be able to act on real life emergencies and apply their knowledge of assessment and management on various diseases and conditions.

PSO 4: Students will be able to explore new areas of research in both Anesthesia & Surgery and can also advance for research as well. Students will be able to explore their integrate knowledge of various types of Surgical Procedures & Anesthetic procedures.

7. Teaching Learning Process

Teaching and learning in this programme involves classroom lectures as well as tutorial and remedial classes.

Tutorial classes: Tutorials allow closer interaction between students and teacher as each student gets individual attention. The tutorials are conducted for students who are unable to achieve average grades in their weekly assessments. Tutorials are divided into three categories, viz. discussion-based tutorials (focusing on deeper exploration of course content through discussions and debates), problem-solving tutorials (focusing on problem solving processes and quantitative reasoning), and Q&A tutorials (students ask questions about course content and assignments and consolidate their learning in the guiding presence of the tutor).

Remedial classes: The remedial classes are conducted for students who achieve average and above average grades in their weekly assessments. The focus is laid to equip the students to perform better in the exams/assessments. The students are divided into small groups to provide dedicated learning support. Tutors are assigned to provide extra time and resources to help them understand concepts with advanced nuances. Small groups allow tutors to address their specific needs and monitor them. Following methods are adopted for tutorial and remedial classes:

- Written assignments and projects submitted by students
- Project-based learning
- Group discussions
- Home assignments

- Class tests, quizzes, debates organised in the department
- Seminars and conferences
- Extra-curricular activities like cultural activities, community outreach programmes etc.
- Field trip, excursions, study tour, interacting with eminent authors, etc.

8. Programme Evaluation

8.1 The Programme structures and examinations shall normally be based on Semester System. However, the Academic Council may approve Trimester/Annual System for specified programmes.

8.2 In addition to end term examinations, student shall be evaluated for his/her academic performance in a Programme through, presentations, analysis, homework assignments, term papers, projects, field work, seminars, quizzes, class tests or any other mode as may be prescribed in the syllabi. The basic structure of each Programme shall be prescribed by the Board of Studies and approved by the Academic Council.

8.3 Each Programme shall have a number of credits assigned to it depending upon the academic load of the Programme which shall be assessed on the basis of weekly contact hours of lecture, tutorial and laboratory classes, self-study. The credits for the project and the dissertation shall be based on the quantum of work expected.

8.4 Depending upon the nature of the programme, the components of internal assessment may vary. However, the following suggestive table indicates the distribution of marks for various components in a semester: -

<table>
<tr><th></th><th>Component of Evaluation</th><th>Marks</th><th>Frequency</th><th>Code</th><th>Weightage (%)</th></tr>
<tr><td>A</td><td>Continuous Evaluation</td><td></td><td></td><td></td><td></td></tr>
<tr><td>i</td><td>Analysis/Class test</td><td rowspan="5">Combination of any three from (i) to (v) with 5 marks each</td><td>1-3</td><td>C</td><td rowspan="6">25%</td></tr>
<tr><td>ii</td><td>Home Assignment</td><td>1-3</td><td>H</td></tr>
<tr><td>iii</td><td>Project</td><td>1</td><td>P</td></tr>
<tr><td>iv</td><td>Seminar</td><td>1-2</td><td>S</td></tr>
<tr><td>v</td><td>Viva-Voce/Presentation</td><td>1-2</td><td>V</td></tr>
<tr><td>vi</td><td>MSE</td><td>MSE shall be of 20 marks</td><td>1-3</td><td>Q/CT</td></tr>
<tr><td>vii</td><td>Attendance</td><td>Attendance shall be of 5</td><td>100%</td><td>A</td><td>5%</td></tr>
</table>

		marks			
B	Semester End Examination		1	SEE	70%
	Project				**100%**

9. Course structure of B.Sc. Operation Theatre Technology

Semester wise Details of B.Sc. Operation Theatre Technology Course and Credit Scheme

B.Sc. (OTT)

Programme Structure

1st Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C111	Anatomy-I (Theory + Practical)	2	0	4	4	6
2	OTT242C112	Physiology- I (Theory + Practical)	2	0	4	4	6
3	OTT242C113	Biochemistry- I (Theory + Practical)	2	0	4	4	6
Skill Elective Courses (SEC)							
4	OTT242S111	SEC1- Surgical Instrumentation-I	0	0	4	2	4
Value Added Courses (VAC)							
5	OTT242V101	VAC1- Select one course from a basket of course	2	0	0	2	2
Generic Elective							
6	OTT242G101	GE1- Hospital Duty and Patient Care- I	3	0	0	3	3
7	OTT242G102	GE1- Medical law and Ethics	3	0	0	3	3
8		GE2- Select one course from a basket of course	3	0	0	3	3
Ability Enhancement Compulsory Courses (AECC)							
9	CEN982A101	Communicative English I	1	0	0	1	1
10	BHS982A104	Behavioural Science–I	1	0	0	1	1
		TOTAL	**16**	**0**	**16**	**24**	**32**

2nd Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C211	Anatomy-II (Theory + Practical)	2	0	4	4	6
2	OTT242C212	Physiology- II (Theory + Practical)	2	0	4	4	6
3	OTT242C213	Biochemistry- II (Theory + Practical)	2	0	4	4	6
Skill Elective Courses (SEC)							
4	OTT242S211	SEC2- Surgical Instrumentation-II	0	0	4	2	4
Value Added Courses (VAC)							
5	OTT242V201	VAC2	2	0	0	2	2
Generic Elective							
6	OTT242G201	GE3- Hospital Duty and Patient Care- II	3	0	0	3	3
7	OTT242G202	GE3- Pathology	3	0	0	3	3
8		GE4- Select one course from a basket of course	3	0	0	3	3
Ability Enhancement Compulsory Courses (AECC)							
9	CEN982A201	Communicative English II	1	0	0	1	1
10	BHS982A204	Behavioural Science–II	1	0	0	1	1
		TOTAL	**16**	**0**	**16**	**24**	**32**

3rd Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C301/ OTT242C311	Introduction to Operation Theatre Technology (Theory + Practical)	2	0	4	4	6
2	OTT242C302/ OTT242C312	Airway Management and Respiratory Emergencies (Theory + Practical)	2	0	4	4	6
Discipline Specific Elective Courses (DSE)							
4	OTT242D301	Medicine Relevant to Operation Theatre	3	1	0	4	4

5	OTT242D302	Pharmacology	3	1	0	4	4
Generic Elective							
7	OTT242G301	GE5- Basic Life Support	3	0	0	3	3
8	OTT242G302	GE5- CSSD Procedures	3	0	0	3	3
9		GE6- Select one course from a basket of course	3	0	0	3	3
Ability Enhancement Compulsory Courses (AECC)							
10	CEN982A301	Communicative English III	1	0	0	1	1
11	BHS982A304	Behavioural Science–III	1	0	0	1	1
Internship							
12		Clinical Posting-I (4 weeks)	0	0	8	4	8
		TOTAL	**15**	**2**	**16**	**24**	**32**

4th Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C401/ OTT242C411	Cardiovascular Emergencies and Neurological Emergencies (Theory + Practical)	2	0	4	4	6
2	OTT242C402/ OTT242C412	Principles of Anesthesia (Theory + Practical)	2	0	4	4	6
Discipline Specific Elective (DSE)							
3	OTT242D401	DSE2- Patient Assessment	3	1	0	4	4
4	OTT242D402	DSE2- Medical equipments, its usage and management	3	1	0	4	4
Skill Elective Courses (SEC)							
5	OTT242S411	SEC3- Medication Administration	0	0	4	2	4
Value Added Courses (VAC)							
6	OTT242V401	VAC3	2	0	0	2	2
Generic Elective							

7	OTT242G401	GE7- Basics of surgical procedures	3	0	0	3	3
8	OTT242G402	GE7- Basics of imaging technology in OT	3	0	0	3	3
9		GE8- Select one course from a basket of course	3	0	0	3	3
Ability Enhancement Compulsory Courses (AECC)							
10	CEN982A401	Communicative English IV	1	0	0	1	1
11	BHS982A404	Behavioural Science–IV	1	0	0	1	1
		TOTAL	**16**	**0**	**20**	**24**	**32**

5th Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C501/ OTT242C511	Operation Theatre Technology- Advanced (Theory+ Practical)	2	0	4	4	6
2	OTT242C502/ OTT242C512	Advance Anesthesia Technique (Theory+ Practical)	2	0	4	4	6
Discipline Specific Elective (DSE) ***(Any two)***							
3	OTT242D501	Biostatistics and Research Methodology	3	1	0	4	4
4	OTT242D502	Disaster Management and Ambulance Operations	3	1	0	4	4
5	OTT242D503	Medical Emergencies	3	1	0	4	4
6	OTT242D504	Surgical tools and techniques	3	1	0	4	4
Value Added Courses (VAC)							
7	OTT242V501	VAC-IV	2	0	0	2	2
Ability Enhancement Compulsory Courses (AECC)							
8	CEN982A501	Communicative English V	1	0	0	1	1
9	EVS982A502	Environmental Studies & Sustainable Development- I	1	0	0	1	1
Internship							
10	OTT242C505	Clinical Posting-II	0	0	12	6	12
		TOTAL	**14**	**4**	**20**	**26**	**36**

6th Semester							
Sl.No.	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
Core Subjects							
1	OTT242C601/ OTT242C611	Intensive Care Unit (Theory+ Practical)	2	0	4	4	6
2	OTT242C602/ OTT242C612	Post Anesthesia Care (Theory+ Practical)	2	0	4	4	6
Discipline Specific Elective (DSE) ***(Any ONE)***							
3	OTT242C601/ OTT242D611	DSE3- Operation Theatre Technology- Clinical (Theory+ Practical)	2	0	4	4	6
5	OTT242C602/ OTT242D612	DSE3- Surgical Procedures Technique (Theory+ Practical)	2	0	4	4	6
Skill Elective Courses (SEC)							
8	OTT242S611	Major Research/ Project	0	0	24	12	12
Value Added Courses (VAC)							
9	OTT242V601	VAC-V	0	0	4	2	2
Ability Enhancement Compulsory Courses (AECC)							
10	CEN982A601	Communicative English VI	1	0	0	1	1
11	EVS982A602	Environmental Studies & Sustainable Development- II	1	0	0	1	1
		TOTAL	**20**	**0**	**8**	**26**	**34**

Bachelor of Operation Theater Technology
1st Semester

Subject Name: Anatomy-I (THEORY)

Course Code: OTT242C101
Course type: Core (C3)

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This course will provide students in-depth instruction in the organization, structures, and functions of the human body. Students will learn the anatomic terminology of each body system and how they interrelate to maintain homeostasis.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Understand** the gross structures of the systems and organs of the human body.	**BT 1**
CO2	**Communicate** information related to these systems through written and verbal format in order to assess current knowledge, answer investigative questions, and explore new questions for additional research.	**BT 2**
CO3	**Apply** concepts and knowledge of the general terminology, cell structure and function, histology, gross anatomy of several organs to clinical	**BT 3**
CO4	**Analyze** the correct location of bones of the human skeleton and the human organs which is necessary for describing and assessing their status.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Introduction:** • Definition of anatomy and its divisions, Terms of location, positions and planes. • Cell and its organelles, Tissues & its classification, Glands.	**6 hours**
II.	**Gastro-Intestinal System:** • Parts of the GIT - mouth, pharynx, oesophagus, stomach • Abdominal cavity - divisions and regions • Liver • Pancreas • Spleen • Gall Bladder	**6 hours**

	• Intestine (small and large)	
III.	**Musculoskeletal System:** • Structure of Bone & its types. • Joints- Classification of joints with examples; details of synovial joint. • Axial skeleton & appendicular skeleton • Bones of appendicular skeleton • Bones of axial skeleton • Locomotor system - bone , cartilage, ligaments and tendons • Skull, spine & its movements, intervertebral disc. • Muscles & its types.	**6 hours**
IV.	**Cardiovascular System:** • Arteries & veins, Capillaries & arterioles. • Heart- size, location, chambers, blood supply of heart, pericardium. • Systemic & pulmonary circulation. • Major blood vessels of Heart. **Lymphatic System:** • Lymph and Lymph vessels. • Structure of lymph node, names of regional lymphatics, axillary and inguinal lymph nodes.	**6 hours**
TOTAL		**24 hours**

ANATOMY-I (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	1. Introduction of the human body. 2. Organisation of tissues of the body. 3. Planes of the human body.	**12 hours**
II.	4. Demonstration of all bones of the human body. 5. Cavities of the human body. 6. Body Movement terminology.	**12 hours**
III.	7. Identification of the quadrants and regions of the body. 8. Identification of the Humerus. 9. Identification of the Radius. 10. Identification of Ulna. 11. Identification of the Hand. 12. Identification of the femur. 13. Identification of the tibia. 14. Identification of the fibula.	**12 hours**

IV.	15. Identification of clavicle. 16. Identification of scapula.	**12 hours**
TOTAL		**48 hours**

Text Book:

1. Sembulingam, K., Sembulingam, P. (2012). Essentials of Medical Physiology, 6th Edition, New Delhi: Jaypee brothers medical publishers.
2. Wilson, J.W., Livingstone, K. C. (1987). Anatomy and Physiology in Health and Illness, 6th Revised Edition, New York: Churchill Livingstone.
3. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice, 13th Edition, USA: Williams & Wilkins

Reference Books:

1. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice. 13thEdition. USA: Williams & Wilkins
2. Arthur, C. Guyton., Hall, E. J. (2011). Text book of Medical Physiology. 12th Edition. USA: Elsevier's.
3. Chatterrje, C.C. (2017). Human Physiology. 11th Edition. Kolkata: Academic Publishers.

Subject Name: Physiology-I (Theory)

Course Code: OTT242C112
Course Type: Core (C3)

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The objective of this course is to provide exposure to the students on cells, structural and functional units of living organisms, and their intricate organization. Moreover, they will learn the functions and vital processes of an organism/an organ /system of organs.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** and understand deep insight into homeostatic mechanisms and the functions of the various organs and organ systems in humans. They will also be able to understand how physiological parameters are measured in humans and animal preparations including blood parameters.	**BT 1**
CO2	**Compare** the physiological aspects of normal growth and development.	**BT 2**
CO3	**Apply** physiologic knowledge to narrate the contribution of each organ system to the maintenance of homeostasis.	**BT 3**
CO4	**Utilize** scientific laboratory equipment in order to gather and **analyze** data on human anatomy and physiology.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Blood** • Red Blood Cells- functions, count, physiological and pathological variations. Erythropoisis-stages. • Hemoglobin-Functions, Physiological variations. • White Blood cells-Functions, count, morphology. • Platelets-count, morphology, functions. • Hemostasis-Definition, Mechanism, clotting factors. • Blood groups-ABO system, Rh system, Blood transfusion-Indication, transfusion reactions. • Anaemia-classification, effects of anaemia on body.	**8 hours**

II.	**Gastro- Intestinal System** • Physiological Anatomy, functions of GIT. • Salivary Gland-functions of saliva. • Stomach-structure and functions, Gastric secretions-composition, functions, Mechanism • Pancreas-structure, functions, composition of Pancreatic juice. • Liver-Functions of liver. • Bile-Composition, functions. • Jaundice-Types and its causes. • Gall Bladder- Functions • Intestine-Movements of small and large intestine. • Digestion and Absorption of Carbohydrates, Protiens, Fats. • Hormones of GIT-Functions of Gastrin, Secretin.	**8 hours**
III.	**Cardiovascular System** • Heart-Physiological Anatomy, Nerve supply, Properties of cardiac muscle. • Cardiac Cycle-Events–systole, diastole. • Cardiac Output-Definition and factors affecting it. • Heart sounds-normal heart sounds, its causes, areas of auscultations. • Blood Pressure- Definition, normal value, Physiological variations, its measurement. • ECG- normal waves. • Shock-Definition, Types.	**8 hours**
TOTAL		**24 hours**

PHYSIOLOGY-I (Practical)

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Identification of laboratory apparatus. Study of compound microscope.	**9 hrs**
II.	Determination of blood haemoglobin level.	**9 hrs**
III.	Determination of bleeding time.	**9 hrs**
IV.	Determination of clotting time.	**9 hrs**
V.	Blood smear preparation staining and differential leukocyte count.	**12 hrs**
TOTAL		**48 hrs**

Text Book:

1. Sembulingam, K., Sembulingam, P. (2012). Essentials of Medical Physiology, 6th Edition, New Delhi: Jaypee brothers medical publishers.
2. Wilson, J.W., Livingstone, K. C. (1987). Anatomy and Physiology in Health and Illness, 6th Revised Edition, New York: Churchill Livingstone.

Reference Books:

1. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice. 13th Edition. USA: Williams & Wilkins
2. Arthur, C. Guyton., Hall, E. J. (2011). Text book of Medical Physiology. 12th Edition. USA: Elsevier's.
3. Chatterjee, C. C. (2017). Human Physiology 11th Edition. Kolkata: Academic Publishers.

Subject Name: Biochemistry-I (Theory)

Course Code: OTT242C113
Course Type: Core (C3)
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This course is designed to introduce the organic structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids laying the foundation for other advanced courses like physiology, cell biology, molecular biology, and immunology.The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the role of biomolecules and their functions.	**BT 1**
CO2	**Understand** the integration of the various aspects of metabolism, and their regulatory pathways.	**BT 2**
CO3	**Identify** the synthesis of proteins, lipids, nucleic acids, and carbohydrates and their role in metabolic pathways along with their regulation at the epigenetic, transcriptional, translational, and post-translational levels including RNA and protein folding, modification, and degradation.	**BT 3**
CO4	**Analyze** structural-functional relationships of genes and proteins.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Carbohydrates:** • Definition and classification of carbohydrates. • Common carbohydrates (Glucose, Fructose, Starch, Glycogen, Starch) and their sources. • Biological significance of Carbohydrate. • Properties of carbohydrates.	**6 hours**

II.	**Lipids:** • Definition and classification of lipids. • Classification of Fatty Acids • Examples and functions of some common lipids (Phospholipids, Glycolipids, Steroid).	**6 hours**
III.	**Nucleic Acids:** • Basic idea of the structure of DNA and RNA • Function of DNA and RNA. • Types of RNA and DNA. • Chargaff's Rule.	**6 hours**
IV.	**Proteins:** • Definition of Proteins along with the Biological significance. • Amino acids and its classification. • Essential and Non-essential amino acids. **Acid-Base Buffers**: • Basic idea of acids, bases, pH, buffer, Acid base balance. **Enzymes** : • Definition and classification of enzyme. • Basic idea of co-enzyme, iso- enzyme. • Mechanism of enzyme Action, Factors affecting enzyme action.	**6 hours**
Total		**24 hours**

Biochemistry-I (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Identifications of instruments and Glasswares.	**9 hrs**
II.	Qualitative analysis of Carbohydrates –Molisch's test, Benedict's test, Barfoed's test, Fehling's test, Seliwanoff's test, Bial's test, Iodine test.	**9 hrs**
III.	Qualitative analysis of Proteins - Precipitation Reaction, Heller's Test, Heat and Acidic Test.	**9 hrs**
IV	Qualitative analysis of Lipids – Solubility test.	**9 hrs**
TOTAL		**48 hr**

Text Book:

1. Nelson, D.L., Cox, M.M. (2017). Lehninger Principles of Biochemistry, 7th Edition; WH Freeman publishers.
2. Robert, K., Murry, Daryl., Granner, K., Victor, W.R. (2015). Harper's Biochemistry, 30th Edition, New Delhi: McGraw-Hill Education / Medical publishers.

Reference Book:

1.Rajagopal, G. & Tura, B.D. (2005). Practical Biochemistry for Medical students. 2nd Edition. Ahuja Publishing House.
2. Harold, Varley. (2005). Practical Biochemistry. 4th Edition. CBS publishers and distributors.

Subject Name: Surgical Instrumentation-I **Course Code: OTT242S111** **Course Type: SEC1** **L-T-P-C – 0-0-8-4** **Scheme of Evaluation: (T/P/TP)**

Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic categories of surgical instruments based upon their functions	**BT 1**
CO2	**Demonstrate** proper care, handling techniques, and safety precautions of *surgical instruments*	**BT 2**
CO3	**Identify** the various surgical instruments and instrument sets and why they are selected for specific surgical procedures	**BT 3**
CO4	**Examine** the instruments' lubrication, and review tray assembly safeguards.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Introduction to surgical instruments** • History • Care and handling of instruments • Parts of an instruments • Instrument categorization • Instrument set	**24 hrs**
II.	**Basic Instruments** • Accessory instruments **General Instruments**	**24 hrs**

III.	**Laparoscopic instruments** • Move to viewing • Probing and dilating instruments **Obstetrics and gynaecologic instruments**	**24 hrs**
IV.	**Genitourinary instruments** **Ophthalmic instruments**	**24 hrs**
TOTAL		**98 hours**

Text Book:

1. Goyal R. C. (1993). Handbook of Hospital Personal Management, Prentice Hall of India, New Delhi, 17–41. Ministry of Health and Family Welfare (1984). National Health Policy, Annual Report (1983–4), Government of India, New Delhi.
2. Surgical Instrumentation, Renee Nemitz.

Subject Name: Hospital Duty and Patient Care- I (Theory)

Course Code: OTT242G101
Course Type: GE1

L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The objective of this course is to provide the students with knowledge on the insights of a hospital and to establish the most medically appropriate, realistic patient care that will apply in the event of clinical deterioration, during an episode of care.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** the concept of the hospital and the role of an OT technician in clinical setting.	**BT 1**
CO2	**Demonstrate** the functional requirements of the hospital in delivery of patient care and the functional requirements of individual departments.	**BT 2**
CO3	**Apply** knowledge of first aid in emergency situations on day-to-day basis.	**BT 3**
CO4	**Examine** the situation of a casualty and form a management plan in or out hospital.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Hospitals:** • Introduction, Functions of Hospitals. • Classification of Hospitals. • Organization of Hospitals. • Department of Hospitals. • Management of Hospitals. • Different services in a Hospital. **Records and Reports:** • Definition, Different types of records. • Values & Objectives. • Maintenance of records. • Principle of good record writing. • Difference of records & reports.	**9 hours**

II.	**First Aid:** • Introduction, Aims & objectives of first aid. • Priorities of first aid. • Golden rules of first aid. • Qualities & responsibilities of first aider. • Simple first aid measures in selected conditions like – Food poisoning, Snake bite, Scorpion bite, Dog bite, Foreign bodies in various organs, • Burns & scalds. **Hygiene:** • Personal Hygiene. • Maintenance of Hygiene. • Maintaining therapeutic environment.	**10 hours**
III.	**Hemorrhage:** • Internal haemorrhage. • External haemorrhage. **Shock:** • Definition. • Types of shock. • Management of shock.	**10 hours**
IV.	**Vital Signs of Patients:** • Blood Pressure • Temperature • Pulse • Respiration	**7 hours**
TOTAL		**36 hours**

Text Book:

3. Goyal R. C. (1993). Handbook of Hospital Personal Management, Prentice Hall of India, New Delhi, 17–41. Ministry of Health and Family Welfare (1984). National Health Policy, Annual Report (1983–4), Government of India, New Delhi.
4. Manual of First Aid- Management of General Injuries, Sports Injuries and Common Ailments, L.C.Gupta and Abhitabh Gupta, Jaypee.
5. **Reference Books:**

1. Hospital supporting services and system, Dr. M.A. Goerge, Daya Publishers.

2. Manual of First Aid, L.C. Gupta and Abhitabh Gupta, Jaypee Publication.

3. Handbook of Healthcare Quality & Patient Safety by .Gyani G J/Thomas.

Subject Name: Medical Law and Ethics (Theory)

Course Code: OTT242G102
Course Type: G1

L-T-P-C 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The course provides an introduction to ethics generally and more specifically to medical ethics, examining in particular the principle of autonomy, which informs much of medical law. The course then considers the general part of medical law governing the legal relationship between medical practitioners and their patients. It considers the legal implications of the provision of medical advice, diagnosis and treatment. Selected medico-legal issues over a human life are also examined. These may include reproductive technologies, fetal rights, research on human subjects, organ donation, and the rights of the dying and the legal definition of death.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** ethics and its importance in the functioning of the hospital.	**BT 1**
CO2	**Outline** the various issues related to healthcare setup and also manage the hospital with the various issues that can arise from the legal perspective.	**BT 2**
CO3	**Recognize** and train the workforce to meet the challenges of changing dynamics in healthcare scenario in terms of the regulations that governs the operational aspects of the hospital.	**BT 3**
CO4	**Distinguish** the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	• Medical ethics - Definition - Goal – Scope • Introduction to Code of conduct • Basic principles of medical ethics – Confidentiality • Malpractice and negligence - Rational and irrational drug therapy	**8 hours**
II.	• Autonomy and informed consent - Right of patients Care of the terminally ill. • Euthanasia Organ transplantation, ethics and law	**12 hours**

III.	• Medico legal aspects of medical records. • Medico legal case and type- Records and document related to MLC - ownership of medical records. • Confidentiality Privilege • Communication - Release of medical information - Unauthorized disclosure – retention of medical records - other various aspects.	**10 hours**
IV.	• Professional Indemnity insurance policy. • Development of standardized protocol to avoid near miss or sentinel events obtaining an informed consent • Consumer protection Act: Act of commission, Act of omission, Act of rashness, negligence & damage, Legal liabilities of medical profession, Advantage & disadvantage of the act.	**6 hours**
TOTAL		**36 hours**

Text Book:

1. Medical ethics: A very short introduction, Tony Hope, 114th edition, Oxford University Press.
2. Medical Law and ethics, 3rd Edition, Pattinson, Sweet and Maxwell publishers.
3. Medical Ethics and Law, A curriculum of the 21st Century, 3rd Edition, Dominic Wilkinson, Jonathan Herring, Julian Savulescu, Elsevie.

References:

1. Medical Law and Ethics, Bonnie F. Fremgen, Pearson Publisher.
2. Essentials of law for health professionals, Kim Forrester and Debra Griffiths, Elsevier.
3. Laws and Ethics for Paramedics- An essential guide. Georgette Eaton, Professional Publishing.

Bachelor of Operation Theater Technology
2nd Semester

Subject Name: Anatomy- II (THEORY)

Course Code: OTT242C211
Course Type: Core (C3)
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This course will provide students in-depth instruction in the organization, structures, and functions of the human body. Students will learn the anatomic terminology of each body system and how they interrelate to maintain homeostasis.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the gross structures of the systems and organs of the human body.	**BT 1**
CO2	**Illustrate** the information related to these systems through written and verbal format in order to assess current knowledge, answer investigative questions, and explore new questions for additional research.	**BT 2**
CO3	**Apply** concepts and knowledge of the general terminology, cell structure and function, histology, gross anatomy of several organs to clinical scenarios.	**BT 3**
CO4	**Analyze** and identify the correct location of bones of the human skeleton and the human organs which is necessary for describing and assessing their status.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Respiratory System:** • Parts of Respiratory system • Structure of nose, nasal cavity, larynx, trachea, lungs, pleural, broncho pulmonary segments. **Urinary System:** • Parts of Urinary system, location and gross structure of kidney, ureter, urinary bladder, urethra.	**6 hours**
II.	**Endocrine glands:** • Name of all endocrine glands, gross structure & functions of pituitary	

	gland, adrenal gland, thyroid gland and parathyroid gland. **Reproductive System:** • Parts of male reproductive system, gross structure of testis, vas deferens, epididymis, prostate. • Parts of female reproductive system, gross structure of uterus, ovary, fallopian tube, mammary gland.	**6 hours**
III.	**Nervous System:** • Neuron, classification of NS. • Meninges, ventricles, CSF. • Gross features of cerebrum, midbrain, pons, medulla oblongata, cerebellum, name of basal nuclei. • Blood supply of brain, cranial nerves. • Spinal cord and spinal nerves. • Autonomic nervous system. • Visual & auditory pathways	**6 hours**
IV.	**Sensory Organs:** • Skin & its appendages. • Structure of eye & lacrimal apparatus, name of extra ocular muscles. • Structure of ear: external, middle & inner ear.	**6 hours**
TOTAL		**24 hours**

ANATOMY-II (Practical)

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Organs of respiratory system.	**9 hrs**
II.	Organs of the urinary system.	**9 hrs**
III.	Organs of the reproductive system.	**9 hrs**
IV.	Organs of the nervous system.	**9 hrs**
V.	Organs of the endocrine system.	**9 hrs**
TOTAL		**48 hr**

Text Book:

1. Sembulingam, K., Sembulingam, P. (2012). Essentials of Medical Physiology, 6th Edition, New Delhi: Jaypee brothers medical publishers.
2. Wilson, J.W., Livingstone, K. C. (1987). Anatomy and Physiology in Health and Illness, 6th Revised Edition, New York: Churchill Livingstone.
3. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice, 13th Edition, USA: Williams & Wilkins.

Reference Books:

1. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice. 13thEdition. USA: Williams & Wilkins
2. Arthur, C. Guyton., Hall, E. J. (2011). Text book of Medical Physiology. 12th Edition. USA: Elsevier's.
3. Chatterrje, C.C. (2017). Human Physiology. 11th Edition. Kolkata: Academic Publishers.

Subject Name: Physiology- II (THEORY)

Course Code: OTT242C212
Course Type: Core (C3)
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The objective of this course is to provide exposure to the students on cells, structural and functional units of living organisms, and their intricate organization. Moreover, they will learn the functions and vital processes of an organism/an organ /system of organs.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** and understand deep insight into homeostatic mechanisms and the functions of the various organs and organ systems in humans. They will also be able to understand how physiological parameters are measured in humans and animal preparations including blood parameters.	**BT 1**
CO2	**Compare** the physiological aspects of normal growth and development.	**BT 2**
CO3	**Apply** physiologic knowledge to narrate the contribution of each organ system to the maintenance of homeostasis.	**BT 3**
CO4	**Utilize** scientific laboratory equipment in order to gather and **analyze** data on human anatomy and physiology.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Respiratory System:** • General organization. • Mechanics of respiration. • Regulation of respiration. • Gaseous exchange in lungs and tissues. • Pulmonary ventilation, volumes and capacities. • Effects of exercise on respiration, hypoxia.	**4 hours**
II.	**Excretory System** • Kidneys-structure of nephron, functions of kidney. • Glomerular filtration Rate(GFR) and factors affecting it. • Urine formation.	**4 hours**

	• Renal function test.	
III.	**Endocrine System** • Classification of Endocrine glands and their hormones. • Structure and hormones of endocrine glands, pituitary, thyroid, parathyroid, pancreas, adrenal, testes and ovary. • Functions and gulaion of secretion of hormones.	**6 hours**
IV.	**Reproductive System** • Male Reproductive System-Stages of spermatogenesis, function of Testosterone • Female Reproductive System-Ovulation, menstrual cycle, functions of estrogen and progesterone	**4 hours**
V.	**Central Nervous System** • Structure of neuron, functions of nervous system. • Classification and properties of nerve fibres • Synapse- structure and types • Receptors-Definition, classification, properties, Reflex Arc • Ascending and Descending tracts- names and functions • Functions of Hypothalamus • Functions of Cerebellum and Basal Ganglia • Functions of Cerebral Cortex • Autonomic Nervous System- Actions of sympathetic and parasympathetic system and their comparison. • Special Senses-Eye-structure, functions of different parts, Visual acuity, Reflective errors. • Ear-structure, functions, General mechanism of hearing.	**6 hours**
TOTAL		**24 hours**

PHYSIOLOGY-II (Practical)

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Determination of Erythrocyte Sedimentation Rate.	**8 hrs**
II.	Determination of Platelet count.	**8 hrs**
III.	Qualitative test for ABO grouping.	**8 hrs**
IV.	Differential Leukocytes count.	**8 hrs**
V.	Determination of Haematocrit.	**8 hrs**

VI.	Total Erythrocyte count using a Hemacytometer.	**8 hrs**
TOTAL		**48 hrs**

Text Book:

1. Sembulingam, K., Sembulingam, P. (2012). Essentials of Medical Physiology, 6th Edition, New Delhi: Jaypee brothers medical publishers.
2. Wilson, J.W., Livingstone, K. C. (1987). Anatomy and Physiology in Health and Illness, 6th Revised Edition, New York: Churchill Livingstone.

Reference Books:

1. Tandon, O.P., Tripathi, R. (2011). Best and Tailor's Physiological basis of Medical Practice. 13thEdition. USA: Williams & Wilkins
2. Arthur, C. Guyton., Hall, E. J. (2011). Text book of Medical Physiology. 12th Edition. USA: Elsevier's.
3.Chatterrje, C.C. (2017). Human Physiology. 11th Edition. Kolkata: Academic Publishers.

Subject Name: Biochemistry- II (THEORY)

Course Code: OTT242C213
Course Type: Core (C3)
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This course is designed to introduce the organic structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids laying the foundation for other advanced courses like physiology, cell biology, molecular biology, and immunology.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** the role of biomolecules and their functions.	**BT 1**
CO2	**Understand** the integration of the various aspects of metabolism, and their regulatory pathways.	**BT 2**
CO3	**Identify** the synthesis of proteins, lipids, nucleic acids, and carbohydrates and their role in metabolic pathways along with their regulation at the epigenetic, transcriptional, translational, and post-translational levels including RNA and protein folding, modification, and degradation.	**BT 3**
CO4	**Analyze** structural-functional relationships of genes and proteins.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Carbohydrate Metabolism :** • Digestion and Absorption of carbohydrates. • Glycolysis, Glucogenolysis and Gluconeogenesis. • Kreb's Cycle, Uronic acid pathway.	**6 hours**

II.	**Protein Metabolism:** • Digestion and Absorption of proteins. • Protein Metabolism - Transamination, Deamination. • Urea Cycle and its Significance. **Lipid Metabolism:** • Digestion and Absorption of Lipids. • ß oxidation of Fatty Acids. • Ketone bodies, Ketosis and ketoacidosis**.** • Biosynthesis of fatty acids.	**6 hours**
III.	**Vitamins and Minerals**: • Definition and classification of vitamins according to solubility. • Sources and functions of individual vitamins. • Deficiency. Individual minerals (calcium, phosphorus, iron, magnesium, copper, selenium, molybdenum etc) – their sources, function and properties.	**6 hours**
IV.	**Clinical Biochemistry:** • Introduction and Importance, Collection and preservation of sample for biochemical analysis. • Normal values of few important biochemical parameters.	**6 hours**
TOTAL		**24 hours**

Biochemistry-I (Practical)

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Collection and preservation of samples.	**9 hrs**
II.	Calculation and preparation of common laboratory reagents - percentage solution, Molarity solution, Normality solution.	**9 hrs**

III.	Estimation of plasma Glucose.	**9 hrs**
IV	Estimation of Total Protein. Estimation of Albumin and calculation of A/G ratio.	**9 hrs**
TOTAL		**48 hrs**

Text Book:

1. Nelson, D.L., Cox, M.M. (2017). Lehninger Principles of Biochemistry, 7th Edition; WH Freeman publishers.
2. Robert, K., Murry, Daryl., Granner, K., Victor, W.R. (2015). Harper's Biochemistry, 30th Edition, New Delhi: McGraw-Hill Education / Medical publishers.
3. Jeremy, M. B., Stryer, L., Tymoczko, J., Gatto, G. (2019). Biochemistry, 9th Edition, New Delhi:WH Freeman publishers.

Reference Book:

1.Rajagopal, G. & Tura, B.D. (2005). Practical Biochemistry for Medical students. 2nd Edition. Ahuja Publishing House.
2. Harold, Varley. (2005). Practical Biochemistry. 4th Edition. CBS publishers and distributors.

Subject Name: Surgical Instrumentation-II

Course Code: OTT242S211
Course Type: SEC1
L-T-P-C – 0-0-8-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic categories of surgical instruments based upon their functions	**BT 1**
CO2	**Demonstrate** proper care, handling techniques, and safety precautions of *surgical instruments*	**BT 2**
CO3	**Identify** the various surgical instruments and instrument sets and why they are selected for specific surgical procedures	**BT 3**
CO4	**Examine** the instruments' lubrication, and review tray assembly safeguards.	**BT 4**

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	**Oral instruments** **Plastic and reconstructive instruments**	**24 hrs**
II.	**Orthopedic instruments**	**24 hrs**
III.	**Neurosurgical instruments** **Cardiovascular thoracic instruments**	**24 hrs**
IV.	**Surgical instrument setup**	**24 hrs**
TOTAL		**98 hours**

Text Book:

1. Goyal R. C. (1993). Handbook of Hospital Personal Management, Prentice Hall of India, New Delhi, 17–41. Ministry of Health and Family Welfare (1984). National Health Policy, Annual Report (1983–4), Government of India, New Delhi.
2. Surgical Instrumentation, Renee Nemitz.

Subject Name: Hospital Duty and Patient Care- II (THEORY)

Course Code: OTT242G201
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: This syllabus has been formulated to impart knowledge on assessment, identification and management of patients suffering from common conditions and the drugs commonly administered. It also emphasized on the sterilization techniques and its importance.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** and identify, assess, manage life threatening conditions in or out hospital.	**BT 1**
CO2	**Outline** the different most common life threatening conditions perceived during pre- operative assessment and assemble a management plan.	**BT 2**
CO3	**Apply** knowledge of sterilization and its essentials in the Operation Theatre and the hospital.	**BT 3**
CO4	**Categorize** certain drugs and their uses for medical purposes.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Poisoning:** Definition, Causes of poisoning, Sources of Poisoning, Symptoms of poisoning, First aid & Management, Antidotes, Common drugs poisoning, Carbon monoxide poisoning**.**	**9 hours**
II.	**Sterilization techniques:** Definition, types, methods, CSSD, Nosocomial infection, Infection control in the Operation Theatre. **Safety in the laboratory:** Common laboratory accidents, physical injuries, electrical shock, chemical injury, bleeding, burn, eye accidents**,** biological hazards.	**9 hours**
III.	**Hyperglycemia:** Definition, Clinical features, Diabetes laboratory tests for diabetes. **Hypoglycemia:** Definition, Etiology & Clinical Features, Investigations for hypoglycemia.	**9 hours**
IV.	**Drugs:** Definition, Names & classification of drugs, Different preparations of drugs, Effects of drugs, Adverse effects of drugs, Tolerance, Abuse, addiction of	**9 hours**

	drugs, Different routes of drug administration, Storing of medicine, Units of standard measurement**.**	
TOTAL		**36 hours**

Text Book:

1. Patient Care Management, A.K. Mohiuddin, Red Flower Publication Pvt. Ltd.
2. Fundamnetals of Hospital Practice and Patient Care, Vyakarnam Nageshwar,Paras Medical Books Put. Ltd.
3. Manual of First Aid- Management of General Injuries, Sports Injuries and Common Ailments, L.C.Gupta and Abhitabh Gupta, Jaypee.

Reference Books:

1. Hospital supporting services and system, Dr. M.A. Goerge, Daya Publishers.

2. Manual of First Aid, L.C. Gupta and Abhitabh Gupta, Jaypee Publication.

Subject Name: Pathology (THEORY)

Course Code: OTT242G202
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective : This syllabus has been formulated to impart basics knowledge on cell and tissue abnormalities and associated diseases and various terminologies of diseases, basic understanding of diseases and their pathogenesis

Course Outcome: Upon completion of this course the student should be able to:

Upon completion of the course student shall be able to:		
SI NO	**COURSE OUTCOME**	**BLOOMS TAXONOMY LEVEL**
CO1	**Comprehend** the basis of pathologic processes	**BT 1**
CO2	**Explain** pathologic processes that apply to individual patients, as well as to the general patient population	**BT 2**
CO3	**Analyze** laboratory and clinical data.	**BT 4**
CO4	**Evaluate** laboratory data for clinicopathologic correlation	**BT 5**

Detailed Syllabusc

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Cell and cellular alterations**: • Cellular adaptation and cell death, Cell injury and adaptation, Atrophy, hypertrophy, metaphase, hyperplasia, Inflammation and repair, infection, circulatory disorders, immune defence, Types of inflammation & system manifestations of inflammation	**9 hrs**
II.	**Haematology** • Hematopoietic and lymphoid System, Haemorrhage, various types of anaemia, leukopenia, leucocytosis, bleeding disorders coagulation mechanism.	**9 hrs**

III	**Infectious agents and Infection**: • The response to infection, Categories of infectious agents, host barriers to infection, Inflammatory response to infectious agents	**9 hrs**
IV	**Circulatory Disturbances**: • Disorders of vascular flow & shock (brief introduction), Oedema, hyperaemia or congestion, thrombosis, embolism, infarction shock, ischemia, over hydration, dehydration. • Neoplasia, Classification of tumours, premalignant lesion	**9 hrs**
TOTAL		**36 hrs**

Text Book:

1.Robbins Basic Pathology (Robbins Pathology) Elsevier; 10th edition

2. A short Textbook of Pathology by JAYPEE.

Reference Books

1. Pathology: Implications for the Physical Therapist, Saunders; 4th edition

Bachelor of Operation Theater Technology
3rd Semester

Subject Name: Introduction to Operation Theatre Technology (THEORY)

Course Code: OTT242C301/OTT242C311
Course Type: Core
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: After completion of the course the students will assist the doctors in Operation Theatres and be an integral part of the care delivery system.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** and understand the complexities of Operation Theatre Technology.	**BT 1**
CO2	**Demonstrate** cognitive skills to handle emergencies and patient breakdowns during complex procedures.	**BT 2**
CO3	**Identify** and have efficiency in handling different types of equipment.	**BT 3**
CO4	**Analyze** and take part in maintaining the OT and patient preparation.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**C.S.S.D and logistics:** Cleaning and dusting – methods of cleaning, General care and testing of instruments-forceps haemostatic, needle, holders, Knife, blade, scissor, use/ abuse, care during surgery, Disinfectants and there instruments and Sterilization-Definition, Methods cleaning agents detergents, Mechanical washing, ultrasonic cleaner, lubrication inspection and pitfalls, Various methods of chemical treatment-formalin, glutraldehyde etc. Thermal. Hot air oven- dry heat, Autoclaving, steam Sterilization water etc. UV treatment. Instrument's Etching, care of micro surgical and titanium instruments, Sterilization of equipments – Arthroscope, Gastroscope, imago Lamp, Suction Apparatus, Anesthetic equipments, endotracheal tubes, OT Sterilization including laminar Air flow, Troubleshooting – colored spots and corrosion, staining, dust deposit, Recent amendment in EPA with reference to waste disposal.	**6 hours**

II.	**Anesthesia Service:** History, pre-operative, Intra operative &post operative care.	**6 hours**
III.	**O. T. Techniques:** OT environment, control of infection scrubbing, theater clothes including lead apron and goggles. Care, maintenance and operational capabilities of beds, lights and other apparatus.	**6 hours**
IV.	**Blood transfusion:** Collection of blood, its preservation and standardization, Various types of blood and blood products(Packed cells, PRP, FFP) , Pre-transfusion checks, Transfusion reactions.	**6 hours**
TOTAL		**24 hours**

Introduction to Operation Theatre (Practical)

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Vital signs. • OT table, OT lights, cautery. • Handling of sterilized articles. • Sterilization technique.	**12 hrs**
II.	• Lay out of instruments trolley • Various Techniques of Injection –Advantages and Disadvantages • Crystalloids and colloids • Techniques of insertion of peripheral IV/IO line	**12 hrs**
III.	• Safety precautions and Preparation of Electronics • Management of Shock, hypoxia , cardiac arrest in OT.	**12 hrs**
IV	• Personal Protective Equipments. • Disposal of Biomedical Waste	**12 hrs**
TOTAL		**48 hrs**

Text Book(s):

1. Berry, Edna carnelia and Mary Louise Kohn - *Introduction to Operating Room technique, 4th edition,* Blukiston Publication
2. Manual of Anaesthesia for Operation theatre Technician, Pillai Ahanatha, Jaypee publishers
3. Fundamentals of operation theatre services, Datta,2nd edition, Jaypee publishers

Reference Book(s):

1. Operation theatre techniques and Management , MP Sharma, AITBS publishers
2. Short book of Anesthesia, Ajay Yadav, 6th edition, Jaypee Publishers
3. Textbook for operation theatre technician, Neelam Rai, Arpit Ravindra Lal, Jaypee publishers.

Subject Name: Airway Management and Respiratory Emergencies (Theory+ Practical)

Course Code: OTT242C302/OTT242C312
Course Type: Core
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: To provide students with theoretical and practical knowledge about the life saving procedures in case of an airway and respiratory emergency that can they can analyze and apply in the OT.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the basic management of airway and respiratory emergencies.	**BT 1**
CO2	**Demonstrate** the different procedures and management for airway and respiratory emergencies.	**BT 2**
CO3	**Identify** life threatening airway and respiratory conditions.	**BT 3**
CO4	**Analyze** various respiratory emergencies and perform basic life support (BLS) and advanced cardiac life support (ACLS) using airway management equipment.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Airway Management** • Review of Anatomy and Physiology • Basic Airway Management • Manual airway maneuvers • Airway Adjuncts • Supplemental O_2 therapy and delivery devices • Suctioning • Assisted and artificial ventilation	**6 hours**
II.	**Advanced airway management** • Endo tracheal intubations • Kings LT Airway • Digital intubations • Laryngeal mask airways and Combitube intubations	**6 hours**

	• Rapid sequence intubations.	
III.	**Surgical Airway** • Surgical and non surgical airways. • Special patient consideration.	**6 hours**
IV.	**Respiratory emergencies – I** • Airway problems versus breathing problems. **Respiratory emergencies - II** • Obstructive airway diseases. • Assessment and management of various respiratory problems.	**6 hours**
TOTAL		**24 hours**

Airway Management and Respiratory Emergencies (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Manual Airway Manuevers • Suctioning procedures • Airway Adjuncts	**12 hrs**
II.	• Supplemental Oxygen Therapy • Supplemental Oxygen delivery devices • Ventilatory support devices.	**12 hrs**
III.	• Advance airway management: • Endotracheal intubation • Alternative advance airway devices and procedures.	**12 hrs**
IV	• Surgical and non surgical critothyrotomy • Tracheostomy.	**12 hrs**
TOTAL		**48 hrs**

Text Books:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.

2. A handbook of Emergencies by Aspi F Golwalla

Reference books:

1. American Heart Association- Basic Life Support, Provider Manual.

2. Emergency Airway Management by Calvin A. Brown

Subject Name: Medicines Relevant to Operation Theatre
Course Code: OTT242D301
Course Type: DSE1
L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: To provide students with theoretical and practical knowledge about the life saving procedures in case of an airway and respiratory emergency that can they can analyze and apply in the OT.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Remember** the various medical conditions encounter in the OT.	**BT 1**
CO2	**Understand** basic management of various medical conditions in the OT.	**BT 2**
CO3	**Apply** knowledge of pathophysiology of different medical conditions relevant to OT patients.	**BT 3**
CO4	**Analyze** the conditions and plan the management of the patient accordingly.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Diabetes Mellitus (DM)** • Signs and symptoms Diabetes Mellitus • Diabetic complications, • Drugs used in diabetes mellitus • Anaesthetic implications of DM • Causes of DM- Type- 1, Type -2 - Gestational diabetes • Prevention • Management -Lifestyle, Medications **Anaemia** • Signs and symptoms • Anaesthetic implications • Causes • Diagnosis • Treatments • Epidemiology	**10 hours**
II.	**Hypertension** • Signs and symptoms • Management • Causes • Pathophysiology • Diagnosis –Prevention	**13 hours**

	Chronic renal failure • Signs and symptoms • Causes • Diagnosis • Treatment • Adjustment of drugs and doses	
III.	**Pregnancy shock** • Managements of various types of shocks during pregnancy • Types and Causes of pregnancy shocks • Clinical Picture of various Shocks **Chronic liver disease/failure** • Causes of chronic liver disease • Physical signs, Recognition, Treatment • Risk factors for various liver diseases • Adjustment of drugs and doses	**13 hours**
IV.	**Obesity** • Diseases associated with obesity • Anaesthetic problems in obese patients • Ideal body weight, adjusted body weight in obese of obesity • Effects on health • Causes • Management **Epilepsy** • Signs and symptoms • Management • Causes • Pathophysiology • Diagnosis • Prevention	**12 hours**
TOTAL		**48 hours**

Text Books:

1. Nancy Caroline's Emergency Care in the Streets.
2. Fundamentals of operation theatre services, Datta,2nd edition, Jaypee publishers

Reference books:

1. Textbook for operation theatre technician, Neelam Rai, ArpitRavindra Lal, Jaypee publishers

2. Emergency Airway Management by Calvin A. Brown

Subject Name: Pharmacology
Course Code: OTT242D302
Course Type: DSE1
L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The prime concern of this syllabus is to integrate basic knowledge and understanding of the elements of pharmacology as well as rational use of drugs, its report to clinical applications, side effects and toxicities of drugs used in medicine and to translate pharmacological principles into clinical decision-making.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the different drugs and identify the pharmacological actions of different categories of drugs.	**BT 1**
CO2	**Understand** the pharmacological actions of different categories of drugs.	**BT 2**
CO3	**Apply** pharmacological actions of different categories of drugs.	**BT 3**
CO4	**Analyze** basic pharmacological knowledge in the prevention and treatment of various diseases.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Introduction:** Definitions, Sources, Common Terminologies used, Types / Classification , Pharmacodynamics: Actions, Therapeutics, Adverse Effect, Toxic Effect , Pharmacokinetics: Absorption, Distribution, Metabolism, Interaction, Excretion , Review: Routes and principles of administration of drugs , Indian Pharmacopoeia(IP): Legal issues , Rational use of drugs.	**10 hours**
II.	**Autonomic Nervous system:** General Considerations, The sympathetic and parasympathetic system and Receptors, Somatic nervous system, Cholinergic and Anti – Cholinergic drugs, Adrenergic and Adrenergic blocking drugs,Skeletal muscle relaxants.	**13 hours**

III.	**Neuropharmacology:** Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines, Antianxiety Drugs: Benzodiazepines, Other Anxiolytics, Antiepileptic drugs, Narcotic analgesics.	**13 hours**
IV.	**Cardiovascular Pharmacology:** Drugs used in the treatment of Heart Failure(Digitalis, Diuretics, Vasodilators), ACE inhibitors Antihypertensive drugs, Beta blockers, Calcium channel Blockers, Central acting Alpha agonists, Peripheral Alpha antagonists, Direct acting vasodilators, Drugs used in the treatment of vascular disease and tissue ischemia, Vascular diseases, Lipid lowering Agents, Antithrombotic, Anticoagulants and Thrombolytics,Ischemic Heart Disease – Nitrates, Beta Blockers, Calcium channel blockers.	**12 hours**
TOTAL		**48 hours**

Text Books:

1. Essentials of Medical Pharmacology: K D Tripathy,8th edition, Jaypee publishers.
2. Textbook of Pharmacology: S D Seth, 3rd edition, Elsevier

Reference books:

1. Basic and Clinical Pharmacology, Katzung and Bertram, 14th edition, Mcgraw Hill Publisher.
2. Pharmacology for undergraduates, Agarwal SL, 3rd edition, CBS publisher.

Subject Name: Basic Life Support
Course Code: OTT242G301
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The aim of this course is to improve the skills and confidence of healthcare professionals to act in crises and improve outcomes for patients with life threatening conditions.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** the importance of basic life support in healthcare.	**BT 1**
CO2	**Understand** the general concepts of Basic Life Support for children and adults	**BT 2**
CO3	**Identify** life threatening conditions and plan for rapid management.	**BT 3**
CO4	**Prioritize** patients with life threatening conditions and make critical decisions.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**General concepts:** • Introduction: BLS course objectives, Provider manual, Age definitions. • High- Quality CPR • The Chain of Survival • Cardiac Arrest or Heart Attack.	**6 hours**
II.	**BLS Healthcare Provider Adult Cardiac Arrest Algorithm** • Adult 1- Rescuer BLS Sequence • Adult Chest compressions • Adults Breaths • Adult 2- Rescuer BLS Sequence • Team roles and duties for 2- Rescuers CPR	**10 hours**
III.	**Automated External Defibrillation for adults and children.** • General concepts • Using the AED	**10 hours**

	• Special considerations	
IV.	**Team Dynamics** • General concepts • Elements of effective Team Dynamics • Debriefing	**10 hours**
TOTAL		**36 hours**

Text Books:

1. Basic Life Support manual by Channing L Bete, American Heart Association.
2. BLS for Healthcare Providers: Student Manual by Jane John Nwankwo

Reference books:

1. Basic Life Support (BLS) Provider Manual, 2020 Guidelines by M. Masterbbjork (MD) and S. Meloni (MD), Medical Creations.

2. Basic Life Support- An Atlas Based Approach by Dr. Rakesh Kumar and Dr. Shakti Datt Sharma, Arya Publications.

Subject Name: CSSD Procedures
Course Code: OTT242G302
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The aim of this course is to improve the techniques, knowledge and confidence of healthcare professionals regarding sterility and maintenance in the Operation Theatre.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** and define the different sterilization methods.	**BT 1**
CO2	**Illustrate** the methods of sterilization of different equipments in the OT.	**BT 2**
CO3	**Organize** demonstration class on the sterility maintenance.	**BT 3**
CO4	**Test for** the sterility maintenance of the apparatus and equipments in the OT.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Sterilization and Disinfection** • Principles of sterilization and disinfection	**6 hours**
II.	**Methods of sterilization**: • Dry Sterilization. • Wet sterilization. • Gaseous sterilization. • Chemical sterilization. • Sterilization by radiation (Gamma rays, ultraviolet rays) • Sterilization of carbonized articles	**10 hours**
III.	**Sterilization of carbonized articles:** • LMA, FOB, ETT, Laryngoscopes, Anesthesia machines and circuits. **Methods of disinfection:** • Boiling. • Chemical disinfection	**10 hours**

IV.	**Hazards, Prevention and advancement in Sterilization:** • Hazards of sterilization in inappropriate methods • Precautions to be taken during sterilization • Recent advance in the methods of sterilization	**10 hours**
TOTAL		**36 hours**

Text Books:

1. Sterilization of Medical Devices - CRC Press Book by Anne Booth.

2. Sterilization Equipment Design and Use, 2013 Edition, AAMI guidelines.

Reference books:

1. Disinfection, Sterilization, and Preservation by Seymour Stanton Block.

Bachelor of Operation Theater Technology
4th Semester

Paper I/Subject Name: Cardiovascular Emergencies and Neurological Emergencies (T+P)
Course Code: OTT242C401/ OTT242C411
Course Type: Core
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The goal of this syllabus is to familiarize the students with the different techniques and devices used for cardiovascular emergencies and their functions to improve and monitor health.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the different cardiovascular and neurological conditions.	**BT 1**
CO2	**Illustrate** the use of basic assessment and management equipments.	**BT 2**
CO3	**Identify** life threatening cardiovascular and neurologic conditions.	**BT 3**
CO4	**Take part in** assisting and managing life threatening conditions.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Cardiovascular System – Emergencies:** Review of Anatomy & Physiology, Assessment & management of Chest pain, Acute coronary syndromes: Pathophysiology & Diagnosis, Management & Complications, Pulmonary Edema, Severe heart failure, Pericardial Diseases, Hypertensive Urgencies & Crisis, Pathophysiology & Classification of Shock States, Resuscitation from Circulatory Shock, Mechanical Support in Cardiogenic Shock, Resuscitation of Hypovolemic Shock, Epistaxis, Aortic Dissection, Atheroembolization.	**6 hours**
II.	**ECG & arrhythmias: 12 lead ECG's:** Different waves of ECG, Depolarization & Repolarization, different heart rhythm, ECG reading.	**6 hours**

III.	**Basic & advanced cardiac life support:** Cardiopulmonary resuscitation, Low Systemic Arterial Blood Pressure, Tachycardia & Bradycardia, Supraventricular Arrhythmias, Ventricular Arrhythmias, Conduction Disturbances & cardiac Pacemakers, Sudden cardiac Death, Implantable Defibrillators.	**6 hours**
IV.	**Neurological emergencies:** Review of anatomy and physiology Assessment and management of Stroke, Seizures, TIA, Altered Mental status, Coma, etc.	**6 hours**
TOTAL		**24 hours**

Cardiovascular Emergencies and Neurological Emergencies (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Cardiac monitoring. • Electrocardiogram. • One- Rescuer CPR • Two- Rescuer CPR	**12 hrs**
II.	• Debrillation: • Manual Defibrillation • Automated External Defibrillator.	**12 hrs**
III.	• Management Chocking: -Pediatric -Adult • Team Dynamic	**12 hrs**
IV	• Management of: • Bradycardia • Tachycardia • Cardiac Arrest	**12 hrs**
TOTAL		**48 hrs**

Text Books:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.

2. A handbook of Emergencies by Aspi F Golwalla

Reference books:

1. American Heart Association- Basic Life Support, Provider Manual.

2. Emergency Airway Management by Calvin A. Brown

Subject Name: Principles of Anaesthesia (Theory+ Practical)
Course Code: OTT242C402/ OTT242C412
Course Type: Core
L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This syllabus is been formulated to develop confidence and maximize skills in anaesthesia work station.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the different component of the anaesthesia machine.	**BT 1**
CO2	**Demonstrate** the working mechanism of the anaesthesia machine and drugs.	**BT 2**
CO3	**Organize** the equipments and devices used in anaesthesia station.	**BT 3**
CO4	**Inspect** the different devices and equipments before and after use and maintenance of the devices.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Anaesthesia Machine:** • Basic Boyles Machine and its functions. • Modern anesthesia machine: Parts and safety features • Hanger and Yoke system, Pin index • Pressure regulator , Pressure gauge • Flowmeters, Vaporisers, scavenging system, ether bottle, Flow meter assembly. • Vaporizers-Types, Hazards, maintenance, Filling and Draining **Breathing System:** • Classification of breathing system • Open, Semi closed and Closed Circuits • Mapleson breathing systems	**6 hours**

	• Jackson and Rees system-Bain's circuit Closed circuit: Components, advantages, disadvantages	
II.	**Anesthesia Equipment Maintenance:** • Method of cleaning and disinfection of anesthetic equipments. • Handling and maintenance of various equipments used in OT • Setting of alarm limits in monitors and ventilators • Electrical faults, earthing	**6 hours**
III.	**Monitors and Gas Analyzers:** • Pulse oxymeter / Plethysmograph • EtCO2 Monitor / Capnograph • NIBP, IBP, Temperature, ECG • FiO2 • Transcutaneous oxygen monitor • Inhalational agents analyser, BIS, Nerve stimulator • Resuscitation Techniques in OT	**6 hours**
IV.	**Artificial Airways:** • Parts of airway (nasal/oral) : • Types, Sizes, insertion techniques, indications for use • Face mask- Types, sizes and its uses. • Supraglottic Airway devices : LMAs – Types, sizes, method of insertion • Endotracheal tubes: Types, sizes, parts • Double lumen tubes, Bronchial blockers, Laryngeal tubes **Minimum Standards of Anaesthesia** • Pre-anaesthesia check list -Drugs and equipments to be kept ready before anaesthesia • Pre operative preparation of patient, Drugs and doses for Premedication • Management of pre operative room and PACU • Transportation Techniques of patient in conscious, semi conscious and unconscious patient to and from operation theatre	**6 hours**
TOTAL		**24 hours**

Principles of Anaesthesia (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Functioning of Anaesthesia Machine, Safety Mechanism of Anaesthesia machine. • Pressor gauge and Pressor Regulater , vapourisers	**12 hrs**
II.	• Semi – Closed , closed circuits. • Cleaning and Maintenance of Anaesthesia Equipments	**12 hrs**
III.	• Capnography, Plathysmography , Gas Analysers • Maintenance of Airway, CPR Technique, Defibrillation, AMBU Bag	**12 hrs**
IV	• Oropharyngeal and nasopharyngeal airways, face masks-types and sizes • Pre anaesthesia checklist	**12 hrs**
TOTAL		**48 hrs**

Text Books:

1. Berry, Edna carnelia and Mary Louise Kohn - *Introduction to Operating Room technique, 4th edition,* Blukiston Publication
2. Textbook for Operation Room Technician, Bhalla, 2nd edition, Ahuja Publishers

Reference books:

1. Operation theatre techniques and Management , MP Sharma, AITBS publishers

2. Short book of Anesthesia, Ajay Yadav, 6th edition, JAypee Publishers

3. Textbook for operation theatre technician, Neelam Rai, ArpitRavindra Lal, Jaypee publishers

Subject Name: Patient Assessment

Course Code: OTT242D401
Course Type: DSE3
L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The overall goal of the Patient assessment is to have all students develop a comprehensive approach to the evaluation and care of the adult, pediatric and geriatric medical patient. During the course, students will continue to improve their ability to obtain, record, analyze and communicate clinical information

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the pathophysiological principles and assessment findings to formulate a field impression; and implement treatment and management of life threatening conditions.	**BT 1**
CO2	**Interpret** data from assessing the patient in or out hospital.	**BT 2**
CO3	**Identify** any life threatening conditions and plan for the management.	**BT 3**
CO4	**Analyze** data based on patient's head to toe assessment and formulate a management and transportation plan.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Patient assessment** • Medical patient assessment • Trauma patient assessment	**10 hours**
II.	**History taking** • Techniques of history taking. • Special assessment challenges. • Vital signs • Head to toe physical examination • Limits of physical exam.	**14 hours**

III.	**Interpretation & Special Situations** • Concept formation • Data interpretation • Application of principle • Reflection in and on action. • Various communication matters. • Documentation techniques. • Verbal and non verbal skills. • Special interview situations.	**10 hours**
IV.	**Venous access** • Fluid composition &distribution in the body • I.V. fluid composition • Routes of medication administration. • Calculating fluid infusion rates.	**14 hours**
TOTAL		**48 hours**

Text Books:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.

2. Compact Clinical guide to critical care, trauma and Emergency Pain Management: An Evidence based Approach for Nurses, Liza Marmo, Yvonne M. Darcy, 1st Edition, Springer publishing house

Reference books:

1. Central Venous access devices: care and Management, Lisa Dougherty, Wiley Blackwell publishers
2. Vessel health and preservation:The right Approach for Vascular Access, edited by Nancy Moureau,Springer publishing.

Subject Name: Medical Equipments, its Usage and Management.

Course Code: OTT242D402
Course Type: DSE1
L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The overall goal of the syllabus is to construct knowledge and understanding about the various medical equipment where students will be able to utilize its functions in various departments in the hospital.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the different medical equipments and devices.	**BT 1**
CO2	**Demonstrate** the uses and functions the particular device and equipment.	**BT 2**
CO3	**Utilize** different devices and equipments based on the medical emergencies.	**BT 3**
CO4	**Distinguished** between the different equipments based on their usage and how to manage them.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Personal protective equipments, Airway management equipment:** • Gloves, Mask, Goggle, Apron etc. • OPA, NPA, Suction Machine, BVM • ET Tube, LMA, Combitube, Kings PtLA etc.	**10 hours**
II.	**Cardiac life support equipment, Trauma life support equipment:** • ECG Machine, Cardiac Monitor, Pulse-Oximeter, • Spignomanometer, Stethoscope, Defibrillator, AED etc. • Splint, Bandage, Cervical Collar, Spine Board, Scoop, Stretcher, KED.	**14 hours**
III.	**Delivery kit:** • Surgical gloves, Mask, Gown, Cord Clamps, Sanitary Pads, Feeding Tube, Bulb Syringe etc. **Neonatal resuscitation kit:** • Infant BVM, Infant ET Tube, Infant Laryngoscope etc.	**10 hours**

IV.	**Extrication equipments:** • Fire extinguisher, Axe, Crib, Crow Bar, Cutter, Rubber Gloves, Hammer etc. **Communication devices:** • Mobile Phone, Radio, Public Addressing System etc.	**14 hours**
TOTAL		**48 hours**

Text Books:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.

2. Compact Clinical guide to critical care, trauma and Emergency Pain Management: An Evidence based Approach for Nurses, Liza Marmo, Yvonne M. Darcy, 1st Edition, Springer publishing house

Reference books:

3. Central Venous access devices: care and Management, Lisa Dougherty, Wiley Blackwell publishers
4. Vessel health and preservation:The right Approach for Vascular Access, edited by Nancy Moureau, Springer publishing.

Subject Name: Medication Administration

Course Code: OTT242S411
Course Type: SEC
L-T-P-C – 0-0-4-2 **Scheme of Evaluation: (T/P/TP)**

Objective: The overall goal of the course is to have the students develop a comprehensive approach to the evaluation and care of the adult, pediatric and geriatric medical patient. During the course, students will continue to improve their ability to obtain record, analyze and communicate clinical information.

On successful completion of the course the students will be able to:		
Sl No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the different instruments use for medication administration.	**BT 1**
CO2	**Demonstrate** the procedures for medication administration.	**BT 2**
CO3	**Develop** and implement a patient care plan.	**BT 3**
CO4	**Classify** the different medications and procedure based on patient condition.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	• Medical Direction • Paramedic's responsibility associated with drug orders • Medical asepsis • Standard precautions • Basic cell physiology • IV fluid compostion	**12 hrs**
II.	• IV techniques and administration • Potential complications of IV therapy • Obtaining blood samples • Blood transfusion	**12 hrs**
III.	• Intraosseous Infusion • Equipments of IO infusion • Procedure to perform IO infusion • Mathemical principles used in medication adminisration	**12 hrs**
IV.	• Critical thinking and Clinical Decision making • Developing and implementing a patient care plan • Concept formation	**12 hrs**
TOTAL		**48 hrs**

Text Book:

1. Nancy Caroline's Emergency Care in the Streets,AAOS.

2. Venous Access A practical Textbook. Mauro pittiruti, Giuseppe Capozzoli, Antonio Delfinoeditore publishers.

Reference books:

1. The Anesthesia Technician and Technologist's Manual by Syed Arslan.

2. Drugs in Anaesthesiology – JAYPEE

Paper I/Subject Name: Basics of Surgical Procedures

Course Code: OTT242G401
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The syllabus is formulated to make the students familiar with blood and its derivatives, keeping blood and its products safe, and paying attention to patients during blood infusion and its possible side effects. Students will learn about certain coexisting diseases, necessary preparations in the event of possible complications, anesthesia techniques in diversity of surgeries and gaining the required skills and ability to take care of the patients in different stages of general and local anesthesia.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the different General surgical procedure and para-surgical equipment use in the OT.	**BT 1**
CO2	**Demonstrate** pre- operative preparation of the patients in the OT.	**BT 2**
CO3	**Identify** any underlying conditions that can abrupt the surgery.	**BT 3**
CO4	**Examine** the different equipments before a surgery.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Blood Transfusion:** • History of discovery of blood groups and genetics of blood groups. • Types of blood groups and Rh factor. • Coombs test. • Collection of blood, its preservation and standardization. • Various types of blood and blood products (Packed cells, PRP, FFP) • Pre-transfusion checks. • Transfusion reactions. • Fluids and electrolytes • Body fluid compartments and the effect of fluid administration on them. • Types of fluids (crystalloids and colloids) and their chemical composition.	**10 hours**

	• Indications of specific fluids and their complications.	
II.	**General surgical procedure and para-surgical equipment:** • Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system. • Different types of diathermy machine. Monopole, Bipolar, Ligasure, Harmonic Scalpel, CUSA- Principle, hazards, prevention, functioning andmaintenance. • Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance. • Operation Theatre sterilization- Different recent advances.	**10 hours**
III.	• LAR/APR--Positioning of patient, CarePrevention of hazards. • Total thyroidectomy—with emphasis on proper positioning. • Transthoracic esophagectomy—Different approaches. • Venesection and Tracheostomy. • Laparoscopic Cholecystectomy – Pneumoperitonium - Creation and removing, principles. • Nephrectomy. • Breast surgery. • Positioning of patient for different operations: Problems and hazards. • Hypothermia and hyperthermia.	**8 hours**
IV.	**Monitoring Techniques and Equipment**: • Cardiac monitors, blood pressure and ECG monitoring. • Respiratory monitors, respiratory rate, Spirometers, SpO2, and EtCO2. • Temperature monitors. • Principles and techniques of temperature monitoring.	**8 hours**
TOTAL		**36 hours**

Text Books:

1. Clinical Anesthesia by Barash.

2. Morgan & Mikhail's Anesthesiology Cases.

3. Manual of Anesthesia for Undergraduates by Satish G. Deshpande

Reference books:

1. The Anesthesia Technician and Technologist's Manual by Syed Arslan.

2. Drugs in Anaesthesiology – JAYPEE

Paper I/Subject Name: Basics imaging technology in the OT.

Course Code: OTT242G402
Course Type: GE1
L-T-P-C – 3-0-0-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The goal of the syllabus is to familiarize the students with the different technologies involve in diagnosis and prognosis of the patient and their advantages in pre and post operative care.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the different advance imaging technologies involve in the diagnosis and prognosis.	**BT 1**
CO2	**Demonstrate** pre- operative preparation of the patients in the OT relevant to the technology used.	**BT 2**
CO3	**Identify** any underlying conditions that can abrupt the surgery.	**BT 3**
CO4	**Examine** the different equipments before a surgery.	**BT 4**

Detailed syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	• Xray • Xray tube, production, properties • Types of radiation • Grid • Darkroom • Cassette	**10 hours**
II.	• Radio waves • Electromagnetic spectrum	**10 hours**
III.	• Mammography • Ultrasound • Transducer • Probs • Echocardiography • Doppler	**8 hours**
IV.	• CT scan and basic principle • MRI and basic principle	**8 hours**

TOTAL	36 hours

Text Books:

1. Basic Medical Radiation physics – Stanton, Publisher-McGraw-Hill Inc.,US

Reference books:

1. Christensen's Physics of Diagnostic Radiology – Christensen, Publisher-Wolters Kluwer India Pvt. Ltd.

5th Semester

Paper I/Subject Name: Operation Theatre Technology - Advanced (Theory & Practical)

Course Code: OTT242C501/OTT242C511
Course type: Core

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This syllabus has been formulated to impart and provide the students with professional skills and personal skills to assist and to be an integral part of the care delivery system in the Operation Theatre.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the different instruments used for different types of surgery.	**BT 1**
CO2	**Demonstrate** patient positioning for different types of surgeries.	**BT 2**
CO3	**Organize** preoperative preparation for the different types of surgeries.	**BT 3**
CO4	**Take part in** assisting in anaesthetic management of different surgical procedures.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Management of a patient in crisis** • Management of poisoning, COPD, snakebite. • Gastric lavage, insertion of nasogastric tube • Ventilation of patient in crisis- Mouth to mouth, Mouth to mask, Ambu bag, short term ventilation/transport ventilator. • Monitoring during transport. • Management of Hypotension, hypoxia, cyanosis, burns	**4 hours**
II.	**Neuro surgery** • Introduction to different neurology surgery and position required for them - Preparation of patient and trolley. • Introduction to neurology special instruments. • Emergency neurology surgery, required instruments **Plastic and reconstructive surgery** • Introduction to Plastic and reconstructive surgeries • Preparation and Positions for different Plastic and reconstructive surgeries • Instrument required for different Plastic and reconstructive surgeries	**6 hours**
III.	**Gynecological/Obstetric Surgeries:** • Introduction to different Gynecological diagnosis and surgeries. • Instrument required for different Gynecological surgeries.	**6 hours**

	• Preparation and Positions for different Gynecological surgeries • Introduction to different Obstetric diagnosis and surgeries - Instrument required for different Obstetric surgeries. • Preparation and Positions for different Obstetric surgeries. • Preparation of trolley for emergency LSCS. • Laparoscopic Gynaecological surgery **Otorhinolaryngologic surgery** • Introduction to Otorhinolaryngologic surgeries • Preparation and Positions for different ENT surgeries • Instrument required for different Otorhinolaryngologic surgeries • Cochlear implant, endoscopy	
IV.	**Urology Surgery, Orthopedic Surgery, Ophthalmic Surgery** • Urology related diagnosis and surgeries • Preparation and Positions for different Urology surgeries • Introduction to different Orthopedic, diagnosis and surgeries • Instrument required for different Orthopedic surgeries • Preparation and Positions for different Orthopedic surgeries • Management of different fractures • Esmarch bandage, tourniquet system, Arthroscopy • Instrument required for different Urology surgeries • Introduction to image -Introduction to different ophthalmic surgeries, Perforating eye injuries • Introduction to different ophthalmic instruments, their handling, cleaning and sterilization. **Thoracic, Cardiac and Vascular Surgery** • Introduction to Thoracic, Cardiac and Vascular surgeries • Instrument required for different Thoracic, Cardiac and Vascular Surgery surgeries • Preparation and Positions for different Thoracic, Cardiac and Vascular Surgery surgeries • Types of perfusion machine -Cell saver techniques • Introduction of Cardiopulmonary Bypass Surgery	**8 hours**
Total		**24 hours**

Operation Theatre Technology- Advanced (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Preparation , positioning for Gyne /obst surgeries	**12 hours**
II.	• Preparation , positioning for different neurological surgeries	**12 hours**
III.	• Preparation , positioning for different orthopaedic, urology, ENT, Ophthalmic surgeries	**12 hours**

IV	• Preparation , positioning for plastic and reconstructive, thoracic, cardiac surgeries	**12 hours**
TOTAL		**48 hours**

Text Book:

1. The Anesthesia Technician and Technologist's Manual, Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana, 1st edition, Lippincott Williams & Wilkins, 2012
2. Clinical Obstetrics and Gynecology, by Sharmila Sharmila & Arun Babu

Reference Book:

1. The Anesthesia Technologist's Manual by Emily S. Guimaraes.
2. Principle of Anesthesia Equipment by JAYPEE.

Paper II/Subject Name: Advanced Anesthesia Techniques (Theory+ Practical)

Course Code: OTT242C502/ OTT242D512
Course Type: Core (C3)

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective The students will become familiar with specific techniques of anesthesia and advance machine used in specialty and subspecialty surgeries and with other diagnostic-therapeutic measures, and attaining the necessary ability to take necessary care of patients.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the different equipments use for patient assessment in anaesthesia.	**BT 1**
CO2	**Compare** normal and abnormal rhythm of the heart and	**BT 2**
CO3	**Identify** arrhythmias and form a management plan.	**BT 3**
CO4	**Inspect** the equipments use in anaesthesia station.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Cardiac Physiology** • Heart as a pump. • Cardiac cycle. • Cardiac contractility and stroke volume. • Cardiac output and its measurement. • Various ECG Leads, their placement and Normal ECG. • Cardiac Arrhythmias (atrial fibrillation, ventricular tachycardia, extra systoles) • Circulatory shock and its physiology • Cardiac failure.	**6 hours**
II.	**Blood Physiology** • Physics of blood flow and pressure. • Measurement of blood flow	**4 hours**
III.	**Cardiopulmonary bypass.** **Devices used to measure blood flow in vein and artery.** • Electromagnetic flow meter, ultrasonic flow meter, plethysmography. • Regulation of arterial pressure and hypertension (Drugs used for treatment of hypertension) • Arterial circulation	**8 hours**

IV.	**Artificial ventilation and related equipment** • Physiology of IPPV (Intermittent positive pressure ventilation) • Principles of mechanical ventilation. • Various modes of IPPV. • Automatic pressure and time cycled ventilators. • Operating room ventilators. • Other types of ventilators (HFJV, NIV) • Complications in patients on ventilators. • General care of a patient on ventilator. • Disinfection and sterilization of ventilators. • Humidification • Principles of oxygen administration and methods used to deliver oxygen. Acid base balance. • Electrolyte imbalance and its relevance to anaesthesia.	**6 hours**
Total		**24 hours**

Advanced Anesthesia Techniques (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Operating a Ventilator • Operating and preparing an Anesthesia Machine.	**12 hours**
II.	• Electrocardiogram- Operating. • Identification of different cardiac rhythms. • Identification of abnormal heart sounds. • Methods of sterilization in the OT.	**12 hours**
III.	• Central venous pressure • LMA • Difficult intubation	**12 hours**
IV	• NIV, CPAP, BiPAP. • Oxygen delivering Devices • Cardiac monitoring	**12 hours**
TOTAL		**48 hours**

Text Book:
1. Clinical Anesthesia by Barash
2. Cardiac Anesthesia Practical Aspects by JAYPEE

Reference Book:
1. The Anesthesia Technologist's Manual by Emily S. Guimaraes
2. Principle of Anesthesia Equipment by JAYPEE

Paper III/Subject Name: Biostatistics and Research Methodology (Theory)

Course Code: OTT242D501
Course Type: DSE1

L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The main objective of this course is to impart knowledge of statistics and develop data based research in healthcare.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** statistics, biostatistics and its importance in health sciences.	**BT 1**
CO2	**Interpret** the meaning of research and find the solutions to the problems being faced in health sciences by applying research techniques.	**BT 2**
CO3	**Utilize** the data generated in health sciences using modern Statistical Methods and writing a report on results interpreted.	**BT 3**
CO4	**Analyze** statistical techniques to scientific research in health-related fields and the development of new tools to study these areas.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Introduction to research methods** • Types of Research • Literary research • Clinical research • Experimental research • Observation and field studies	**12 hrs**
II.	**Identifying research problem** • Definition Selection • Sources of research problems **Ethical issues in research** **Research design** • Types of Research design • Control in research design • Selection criteria • Placebo and plain control • Randomization Balancing and matching	**12 hrs**

III.	**Basic Concepts of Biostatistics** • Scope and utility of Biostatistics Descriptive Statistics • Analysis of Data • Probability **Types of Data** • Data collection, tabulation and presentation of data. • Measure of central tendency – Mean, Median and Mode. • Measures of dispersion: Range, quartile deviation, standard deviation.	**14 hrs**
IV.	**Research tools and Data collection methods** • Interview, questionnaire, inventories, scales • Rating scales **Sampling methods** • Types and sample size • Randomized sampling **Developing a research proposal** • Protocols for experimental. • Clinical and community based research. • Writing research report. • References in research report.	**10 hrs**
Total		**48hrs**

Text Book:

1. Research methodology and Biostatics by Suresh K Sharma
2. Basic of Nursing Research and Biostatics by JAYPEE

Reference Book:

1. Research Methodology Methods and Techniques; C.R. Kothari; 2nd edition; New Age International ; 1990 (republished in 2009).
2. Research Methodology Methods and Statistical Techniques; Santosh Gupta; New Delhi: Deep & Deep Publications; 2000.

Paper IV/Subject Name: Disaster Management and Ambulance Operations

Course Code: OTT242D502
Course Type: Discipline Specific Elective (DSE1)

L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The objective of this course is to prepare the students to identify, minimize the hazard and patient care management during a disaster.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the different natural and manmade disaster and its management.	**BT 1**
CO2	**Outline** the paramedic response to disasters.	**BT 2**
CO3	**Build** and initiate management plan for disaster affected patients.	**BT 3**
CO4	**Examine** and foresee any scene and initiate proper entry and exit plan.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Ambulance operations, Medical incident command** • Understanding your ambulance • Ambulance staffing and development • Emergency vehicle operation • Air medical transport • The incident command • Standard operating procedures • Medical incident command • Triage	**12 hours**
II.	**Terrorism and weapons of mass destruction, Rescue awareness and operations** • Terrorism • Weapons of mass destruction • Paramedic Response to terrorism • Chemical agents • Biological agents • Radiological/nuclear devices • Guide lines for operations • Steps of special rescue • General rescue scene procedure • Assisting rescue crews • Patient care	**12 hours**

III.	**Hazardous material incidents** • Identification of hazardous materials • Hazardous scene management • Contamination and toxicology • Decontamination and treatment	**12 hours**
IV.	**Crime scene awareness** • Awareness • Highway incidents • Residential incidents • Violence on the streets • Hostage situations • Contact and cover • Self defence • Preserving crime scene evidence **Disaster management** • Understanding natural and manmade disasters • Understanding effects of disasters • Prevention, preparation, response • Medical response to disasters • Mock drills	**12 hours**
TOTAL		**48 hours**

Text Book:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.
2. An introduction to Diasater Management: Natural Diasaters and Man Made Hazards by S. Vaidhyanathan.

Reference Book:

1. Emergency Medicine, trauma and Disaster Management: Prehospital to hospital care and beyond by Emmanouil Pikoulis and Jay Doucet.

2. Mahajan's Methods in Biostatistics for Medical Students and Research Workers by Bratati Banerjee.

Paper V/Subject Name: Medical Emergencies (Theory)

Course Code: OTT242D503
Course Type: DSE1

L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The student demonstrates the ability to conduct a focused medical history and targeted physical examination appropriate to the patient's chief complaints and the history of the present illness and apply appropriate clinical pharmacological principles in the selection of drugs to treat common problems.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the different Gynaecological and Obstetrics emergencies.	**BT 1**
CO2	**Summarize** a full management plan for the different emergencies.	**BT 2**
CO3	**Develop** an assessment plan and discover the crises of the patient.	**BT 3**
CO4	**Simplify** the pathopgysiology, assessment and management of the different emergencies.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Behavioral Emergencies** • Psychiatric signs and symptoms • Assessment and management of behavioural emergencies • Management and handling of hostile and violent patients.	**10 hours**
II.	**Gynecological emergencies - I** • Pathophysiology of various diseases • Assessment and management **Labor & Its Complications** • Complications of pregnancy and labor. • Trauma during pregnancy. • Normal Delivery and abnormal deliveries.	**14 hours**
III.	**Obstetrics:** • Review of anatomy of female reproductive system • Conception and gestation • Physiology of maternal changes during pregnancy. • Medical conditions that can be detrimentally affected by	**10 hours**

	Pregnancy.	
IV.	**Endocrine emergencies, Allergic emergencies** • Review of Anatomy and physiology • Pathophysiology • Assessment and management **Gastro intestinal, Renal and urological emergencies** • Review of Anatomy and physiology • Pathophysiology • Assessment and management	**14 hours**
TOTAL		**48 hours**

Text Book:

1. Nancy Caroline's Emergency Care in the Streets, AAOS.

2. Clinical Obstetrics and Gynecology, by Sharmila Sharmila & Arun Babu

Reference Book:

1. Falcon Clinical Cases in Obstetrics And Gynecology History taking - Case Discussion - Viva Voice and Instrument by by Naseha Fatthima

2. Emergency Medical Services by SN Chugh.

Paper VI/Subject Name: Surgical tools and Techniques

Course Code: OTT242D504
Course Type: DSE1
L-T-P-C – 3-1-0-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The aim and objective of this course is to know about various tools & Techniques used in Operation Theatre.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various surgical positions, procedures and instruments.	**BT 1**
CO2	**Demonstrate** the Procedures like IV, catheterization and blood transfusion, patient transportation etc.	**BT 2**
CO3	**Build** team work.	**BT 3**
CO4	**Analyzed** priority patients and management approach.	**BT 4**

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Introduction of surgery and basic principles of surgeries, surgical team • Surgical safety checklist • Various types of surgical incisions • Suturing techniques • Sutures and its types • Various surgical positions with their complications and management • Pneumatic Tourniquet and its uses, • Suffix and prefix related to surgeries • Urinary Catheter, RT & IV Cannula Insertion.	**12 hours**
II.	• IV Fluids & their Classification • Blood Transfusion -Indications & Complications • Monitoring in the Operation Theatre • Positioning of Patient during different surgical procedures • Potential sources of injury to the caregiver & patient • Transportation of Patient to OT • Transportation of Critically ill Patient- Inter-Hospital Transportation & Intra-Hospital Transportation.	**12 hours**
III.	• Preoperative preparation of the patient • Written Informed Consent • Review of bladder catheterization • Positioning the surgical patient • Application of pneumatic tourniquets • Skin preparation	**12 hours**

	• Drapes and draping • Operative instrumentation • Hemostasis Drainage systems- Tube Drains & Suction Drains	
IV.	• Specials Precautions taken for Pregnant Patient, Diabetic Patient, HIV Patient • Hemophilic Patient, Infant, Elderly etc. • Labour Analgesia Methods • Postoperative pain control methods • Diagnostic procedures in OR: • Pathological examination, Radiological examination, MRI, Ultrasonography	**12 hours**
TOTAL		**48 hours**

Text Book:

1. Synopsis of medical Jaypee instruments, Ajay Yadav and Arora by JAYPEE
2. Operation Theatre Techniques, M.P. Sharma, AITBS Publishers & Management

Reference Book:

1. A primer of Anesthesia by Rajeshwari Subramanian.

2. Principles of Anesthesia Equipment by JAYPEE.

Paper VII/Subject Name: Clinical Posting- II
Course Code: OTT242C513

L-T-P-C – 0-0-12-6 **Scheme of Evaluation: (T/P/TP)**

Objective: The objective of the course is to educate the students and prepare them for future real-life situations and to enhance the delivery of health care in the Operation Theatre setting.

1. Students will observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients. The student will be introduced to terminologies, equipment, and techniques used for preparation and management of the OT.
2. Students will gain additional skills in clinical preparation, interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experience under the supervision of a senior technical officer
3. Students will improve their skills in clinical procedures. Progressive interaction with patients and professional personnel are monitored as students practice in a supervised setting. Additional areas include problem solving, identifying machine components and basic side effect management. Students will demonstrate competence in beginning, intermediate, and advanced procedures.
4. The course provides students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures.

6th Semester

Paper I/Subject Name: Intensive Care Unit (Theory & Practical)
Course Code: OTT242C601/ OTT242C611
Course Type: Core (C3)

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: Students will become familiar with the new methods of care, diagnosis and treatment of patients in critical conditions, the use of instruments and equipment, and the way to manage an intensive care unit (ICU)

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the organization, standards, rules, and management method of an ICU.	**BT 1**
CO2	**Illustrate** the new methods of care, diagnosis and treatment of patients in critical conditions, the use of instruments and equipment, and the way to manage an intensive care unit.	**BT 2**
CO3	**Identify** and manage difficult airways of Patients and able to ventilate in crisis.	**BT 3**
CO4	**Take part in** the use and maintenance of equipment and instruments, methods of diagnosis and treatment, rehabilitation and respiratory care, infection control, and the way to take care of critically ill patients suffering from the disorders of different body systems and needing special attention.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Care and maintenance of ventilators, suction machine, monitoring devices and other apparatus.** • Sterilization and disinfection of ventilators. • Care, maintenance and operational capabilities of beds, lights and other apparatus. • Air conditioning and control of pollution in ICU. • Attachment and intraoperative utility of ventilator and monitoring devices. • Principles of ABG machines.	**6 hours**
II.	**Care and management of Patient in ICU**. • Care of unconscious adult and Pediatric patients. • Physiotherapy techniques, feeding, Ryle's tube insertion and hyper alimentation.	**4 hours**

	• Suctioning and posturing of semiconscious and unconscious patients. • Oxygen therapy, maintenance of clear Airway. • Psychological aspects of the patient, relative and staff. • Management of asepsis. • Management of tetanus patient.	
III.	**Airway management and ventilation in crisis.** • Mouth to mouth. • Mouth to ET Tube. • Resuscitator/ bag valve mask assembly. • Different types of Airways. • Short term ventilation/ Transport ventilators. • Detection of blood gases of the patient, • Hemofiltration and haemodialysis.	**6 hours**
IV.	**Ventilators: Principles of working of different ventilators** • Volume cycled/Time cycled/Pressure cycled ventilators. • High frequency ventilators and other types. • Methods of measuring the expired gases from the patient.Types of spirometers, Principles of working of spirometers. Clinical application of above apparatus. • Apparatus and techniques of measuring of blood pressure and temperature; Principle and working of direct/indirect blood pressure monitoring apparatus; structure, principle and working of the oscillotonometer. Principles and working of aneroid manometer type B.P. instrument. • Laryngeal sprays; Types, material, principle and mechanism. • Monitoring techniques and equipment; Cardiac monitors, Respiratory monitors, Spirometers, Temperature monitors.	**8 hours**
TOTAL		**24 hours**

Intensive Care Unit (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Vital signs • Arterial Blood Collection. • Ryle's Tube Insertion	**12 hours**
II.	• Suctioning- Oral and Tube • Assembling of the difficult Airway Cart • Extubation Procedure • Operating a Ventilator machine	**12 hours**
III.	• Patient Positioning	**12 hours**

	• Catheterization- Male and Female	
IV	• Cleaning, Sterilization, Care & Maintenance of Instruments • Assembling different trays for different procedures.	**12 hours**
TOTAL		**48 hours**

Text Book:

1. Mechanical Ventilation Book by C. Chang.
2. Handbook on Critical Care, Deepak Malviya & Somya Sankar Nath.

Reference Book:

1. The Washington Manual of Critical Care, Marin h. Koffef & A. Cole Burks.

2. The Intensive Care Unit Manual by Benjamin A. Kohl (Author), MD Hanson, C. William

Paper II/Subject Name: Post Anesthesia Care (Theory & Practical)

Course Code: OTT242C602/ OTT242C612
Course Type: Core

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The students will become familiar with the principles of general and local anesthesia, and the organizational structure, equipment, tools and instruments, facilities, and rules related to the field of anesthesiology.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Name** the complications post surgery and its management.	**BT 1**
CO2	**Demonstrate** patient care post anaesthesia.	**BT 2**
CO3	**Identify** priority and conditions for immediate assistance.	**BT 3**
CO4	**Examine** and care in response to abnormal physiological observation.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**Setting up of PACU:** • Definition of PACU • Set up • Staff/patient ratio • Monitoring in PACU	**4 hours**
II.	**Discharge criteria** • Criteria for Shifting patient out of PACU • Aldrete score / Modified Aldrete score • Discharge criteria	**4 hours**
III.	**Common complications & its management in PACU** • Post Operative Complications And Its Management • Nausea & Vomiting • Sore throat • Hoarseness of voice, loss of voice • Airway obstruction, desaturation, bronchospasm, laryngospasm, • Unresponsiveness • Neurological complications. – • Coma, seizures, CVA(stroke), cerebral hypoxia, • Pulmonary edema • Haemorrhage from the surgical site • Vascular complications:-DVT, embolism,(thrombus, air, fat, amniotic) • Trauma to teeth	**8 hours**

	• Headache • Backache • Ocular complications • loss of vision • Hypotension, hypertension, • Bradycardia, tachycardia, arrhythmia, myocardial infarction • Hypoglycemia, hyperglycemia • Electrolyte imbance-hyponatremia, hypokalemia, hyperkalemia	
IV.	**Post operative pain relief** • Management of postoperative pain- narcotics, NSAID (IM/IV), local anaesthetics through catheters, transdermal patches **Causes of mortality in PACU** • Mortality -myocardial infarction, arrhythmias, hypoxia, electrolyte imbalance, respiratory depression. • Massive haemorrhage, embolism. • Components of Emergency tray / Trolley in PACU	**8 hours**
TOTAL		**24 hours**

Post Anaesthesia Care (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Medications due during PACU • Vital signs and monitoring trends (CV, respiratory, neuromuscular function) • Assessment of Wound Sites / Dressings • Neurological Assessment (AVPU, Michigan sedation score or formal GCS as indicated)	**12 hours**
II.	• Pain Score • PACU orders • Airway management.	**12 hours**
III.	• Pain and comfort management plan • Patient-specific procedure and hemodynamic considerations	**12 hours**
IV	• Patient transport • Assembling emergency tray • Assembling trolley in PACU	**12 hours**
TOTAL		**48 hours**

Text Book:
1. Oxford Textbook of Transplant Anesthesia & Critical Care
2. Essentials of Anesthesia & Critical care by JAYPEE

Reference Book:
1. A primer of Anesthesia by Rajeshwari Subramanian.

2. Principles of Anesthesia Equipment by JAYPEE

Paper III/Subject Name: Operation Theatre Technology- Clinical (Theory & Practical)

Course Code: OTT242D601/OTT242D611
Course Type: Discipline Specific Elective (DSE3)

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: This syllabus has been formulated to impart knowledge on basic organization and function of Operation theatre. Students will be introduced to terminologies, equipment and techniques used for the preparation and management of OT.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Select** and organize the different surgical equipment according to their uses.	**BT 1**
CO2	**Understand** and the plan, the structural framework of the operation theatre zones.	**BT 2**
CO3	**Explain** the different sterilization and practice methods of sterilization including fumigation.	**BT 3**
CO4	**Inspect** and handle delicate surgical instruments.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	**OPERATION THEATRE** • Lay out, Physical Facility, Peripheral support area, • Introduction to Operating Room • Physical facilities available in OT • Layout of operation theatre, Zoning • Maintenance of Temperature, humidity. Laminar air flow, Air circulation • Peripheral support areas • OT hazards : Potential source of injury to the care giver and patients • Special procedure rooms	**6 hours**
II.	**Surgical equipments** • Classification of different surgical equipments • Surgical instrumentation fabrication • Uses and maintenance of Powered surgical instruments • Things to remember while handling instruments • Preparation of surgical trolley	**6 hours**

III.	**Specialized surgical equipment** • Uses, care and maintenance of specialized surgical equipments like electric cautery, laparoscopes, Laser microsurgery equipments • Endoscopes • Handling of delicate instruments	**4 hours**
IV.	**Suture Material and Needles** • Types • Uses • Disinfection • Storage **Preparation and Assisting for Various Surgical Procedures; as Circulating and Scrub Technician** • Role of OT technician during surgery • Setting up of operation room and table • Setting up of trays and trolleys for various surgical procedures • Part preparation for surgical procedures • Positioning and draping according the surgical procedures • Incisions for various surgical procedures • Requirement of suturing materials for different surgeries.	**8 hours**
TOTAL		**24 hours**

Operation Theatre Technology- Clinical (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Layout of OT , OT lights, laminar airflow • Maintenance of Temperature, humidity and sterility	**12 hours**
II.	• Classification of surgical instruments • Preparation of surgical trolley	**12 hours**
III.	• Handling and maintenance of Endoscope, laparoscope, microsurgical instruments	**12 hours**
IV	• Positioning , Part preparation, draping • Various types of suture material, needles and uses.	**12 hours**
TOTAL		**48 hours**

Text Book:
1**.** Operation theatre techniques and Management , MP Sharma, AITBS publishers

2. Berry, Edna carnelia and Mary Louise Kohn - *Introduction to Operating Room technique, 4th edition,* Blukiston Publication.

Reference Book:
1. Operation theatre techniques and Management , MP Sharma, AITBS publishers.

2. Operation Theatre Techniques, M.P. Sharma, AITBS Publishers & Management

Paper IV/Subject Name: Surgical Procedures (Theory & Practical)

Course Code: OTT242D602/OTT242D612
Course Type: DSE3

L-T-P-C – 2-0-4-4 **Scheme of Evaluation: (T/P/TP)**

Objective: The aim and objective of this course is to become familiar with blood and its derivatives, keeping blood and its products safe, and paying attention to patients during blood infusion and its possible side effects. Students will learn about certain coexisting diseases, necessary preparations in the event of possible complications, anesthesia techniques in diversity of surgeries and gaining the required skills and ability to take care of the patients in different stages of general and local anesthesia.

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various surgical positions, procedures and instruments.	**BT 1**
CO2	**Demonstrate** the Procedures like IV, catheterization and blood transfusion, patient transportation etc.	**BT 2**
CO3	**Build** team work.	**BT 3**
CO4	**Analyzed** priority patients and management approach.	**BT 4**

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• I&D, Circumcision, Catherization, stitch removal. • Removal of fibromas, tracheostomy. • Biopsy and its types, Bone marrow biopsy. • Liver biopsy. • Renal biopsy. • Pleural biopsy. • Abdominal paracentesis. • Tumors- benign and malignant, Cysts, ulcers, sinuses & fistula, • Differential diagnosis of cyst and tumor • Removal of Sebaceous Cyst, Ganglion etc.	**6 hours**
II.	• General surgical procedures- • Hiatus hernia, Gastrectomy, Partial hepatectomy, Open cholecystectomy, • Whipple's procedure, colectomy, gastrostomy, colostomy. • Umbilical hernia, inguinal hernia, Appendectomy • Difference between herniotomy, hernioplasty, and herniorrhaphy,	**6 hours**

	Hydrocele, hemorrhoidectomy.	
III.	• Common orthopedic procedures -ORIF and CRIF, Arthroscopy, THR, TKR, Laminectomy, Herniated disk surgery, Osteotomy, Rotator cuff surgery etc. • Incisions given in gynae procedure, episiotomy, D&C, D&E, MTP, MRP, Caesarean section, tubal ligation, abdominal and vaginal hysterectomy, myomectomy, oophorectomy. • Lap. Assisted vaginal hysterectomy	**6 hours**
IV.	• Laparoscopic procedures – Laparoscopic Cholecystectomy, Lap. Appendectomy, • Lap. Inguinal hernia repair techniques (TAPP and TEP), • Lap. Partial gastrectomy, etc. • Laparoscopic Hysterectomy, Ligation & Tubectomy. • Common urological procedures - TURP, TUNA, TUIP, cystoscopy, nephrectomy, ESWL. vasectomy, Orchiopexy and Orchidectomy, PCNL, ureteroscopy	**6 hours**
TOTAL		**24 hours**

Operation Theatre Technology- Surgical Procedures (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Technique of Incision & Drainage. • Technique of Wound Cleaning & Suturing & Dressing. • Technique of Cyst removal.	**12 hours**
II.	• Technique of Biopsy taking. • Common General Surgical Procedures.	**12 hours**
III.	• Common Urological Procedures. • Common Laparoscopic Procedures.	**12 hours**
IV	• Common Orthopedic Procedures. • Common Gynecological Procedures.	**12 hours**
TOTAL		**48 hours**

Text Book:

1. Synopsis of medical Jaypee instruments, Ajay Yadav and Arora by JAYPEE
2. Operation Theatre Techniques, M.P. Sharma, AITBS Publishers & Management

Reference Book:

1. A primer of Anesthesia by Rajeshwari Subramanian.

2. Principles of Anesthesia Equipment by JAYPEE.

Paper VII/Subject Name: Major Project

Course Code: OTT242S611

L-T-P-C – 0-0-24-12 **Scheme of Evaluation: (T/P/TP)**

Objective: The aim and objective of this course is to know about various tools & techniques used in Operation Theatre.

A project will be given to group of 3-5 students after completion of 5th semester. Students will be given with a research topic within the field by the supervisor. Students have to do the experimental plan, summarize the results and present the result of the project.

Project includes use of relevant scientific literature according to the topic given; students should apply experimental methods, collect data for evaluation, use appropriate statistical tools if necessary, document results by writing report. Data Collection and project work can be done parallel during their Clinical posting.

Student's performance shall be evaluated on written project report, a written abstract and a presentation in the department. The faculty shall submit the assessment records of each student under his/her supervision to the HOD.