d

ROYAL SCHOOL OF MEDICAL AND ALLIED SCIENCES (RSMAS)

DEPARTMENT OF OPERATION THEATRE TECHNOLOGY

COURSE STRUCTURE & SYLLABUS
(BASED ON NATIONAL EDUCATION POLICY2020)

FOR

B.Sc. IN OPERATION THEATRE TECHNOLOGY
(4 YEARS SINGLE MAJOR)

W.E.F
AY 2023- 2024

TABLE OF CONTENTS:

PREAMBLE

The National Education Policy (NEP) 2020 conceives a new vision for India's highereducation system. It recognizes that higher education plays an extremely important rolein promoting equity, human as well as societal well-being and in developing India asenvisionedinitsConstitution.Itisdesiredthathighereducationwillsignificantlycontribute towards sustainable livelihoods and economic development of the nation asIndiamovestowardsbecomingaknowledgeeconomyandsociety.

If we focus on the 21st century requirements, the higher education framework of thenation must aim to develop good, thoughtful, well-rounded, and creative individuals andmust enable an individual to study one or more specialized areas of interest at a deeplevel,andalsodevelopcharacter,ethicalandConstitutionalvalues,intellectualcuriosity,scientifictemper,creativity,spiritofservice,andtwenty-first-centurycapabilitiesacrossarangeofdisciplinesincludingsciences,socialsciences,arts,humanities,languages,aswellasprofessional,technical,andvocationalsubjects.Aquality higher education should be capable enough to enable personal accomplishmentand enlightenment, constructive public engagement, and productive contribution to thesociety.Overall,itshouldfocusonpreparingstudentsformoremeaningfulandsatisfying livesandworkrolesand enableeconomicindependence.

Towardstheattainmentofholisticandmultidisciplinaryeducation,theflexiblecurricula of the University will include credit-based courses, projects in the areas ofcommunityengagementandservice,environmentaleducation,andvalue-basededucation.Aspartofholisticeducation,studentswillalsobeprovidedwithopportunities for internships with local industries, businesses, artists, crafts persons,and so on, as well as research internships with faculty and researchers at the University,so that students may actively engage with the practical aspects of their learning andtherebyimprovetheiremployability.

The undergraduate curriculums are diverse and have varied subjects to be covered tomeettheneedsoftheprograms.AspertherecommendationsfromtheUGC,

introduction of courses related to Indian Knowledge System (IKS) is being incorporatedin the curriculum structure which encompasses all of the systematized disciplines ofKnowledgewhichweredevelopedtoahighdegreeofsophisticationinIndiafromancient times and all of the traditions and practises that the various communities ofIndia—includingthetribalcommunities—haveevolved,refinedandpreservedovergenerations,like forexampleVedicMathematics,Vedangas,IndianAstronomy,FineArts,Metallurgy,etc.

At RGU, we are committed that at the societal level, higher education will enable eachstudent to develop themselves to be an enlightened, socially conscious, knowledgeable,and skilled citizen who can find and implement robust solutions to its own problems.For the students at the University, Higher education is expected to form the basis forknowledge creation andinnovation thereby contributing toa more vibrant, sociallyengaged,cooperativecommunityleadingtowardsahappier,cohesive,cultured,productive,innovative,progressive,andprosperousnation."

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

Abbreviations

1. Cr. - Credit
2. Major - Core Courses of a Discipline
3. Minor - May/may not be related to Major.
4. SEC - Skill Enhancement Course
5. VAC - Value Addition Course
6. AEC- Ability Enhancement Course
7. GEC - Generic Elective Course
8. IKS - Indian Knowledge System
9. AICTE - All India Institute of Technical Education
10. CBCS - Choice Based Credit System
11. HEIs - Higher Education Institutes
12. MSDE - Ministry of Skill Development and Entrepreneurship
13. NAC - National Apprenticeship Certificate
14. NCrF - National Credit Framework
15. NCVET - National Council for Vocational Education and Training
16. NEP - National Education Policy
17. NHEQF - National Higher Education Qualification Framework
18. NSQF - National Skill Qualifications Framework
19. NTA - National Testing Agency
20. SDG - Sustainable Development Goals
21. UGC - University Grants Commission
22. VET - Vocational Education and Training
23. ME-ME - Multiple Entry Multiple Exit
24. OJT - On Job Training
25. NCH - Notional Credit Hours

INTRODUCTION

The National Education Policy (NEP) 2020 clearly indicates that higher education playsan extremely important role in promoting human as well as societal well-being in India.As envisioned in the 21st-century requirements, quality higher education must aim todevelop good, thoughtful, well-rounded, and creative individuals. According to the neweducation policy, assessments of educational approaches in undergraduate educationwillintegratethehumanitiesandartswithScience,Technology,EngineeringandMathematics(STEM)thatwillleadtopositivelearningoutcomes. Thiswillleadtodevelop creativity and innovation, critical thinking and higher-order thinking capacities,problem-solving abilities, teamwork, communication skills, more in-depth learning, andmastery of curricula across fields, increases in social and moral awareness, etc., besidesgeneral engagementand enjoyment oflearning.andmorein-depthlearning.

The NEP highlights that the following fundamental principles that have a direct bearingonthecurricula would guidetheeducationsystematlarge,viz.

i. Recognizing, identifying, and fostering the unique capabilities of each student topromoteher/hisholisticdevelopment.
ii. Flexibility,sothatlearnerscanselecttheirlearningtrajectoriesandprogrammes, andthereby choose theirown pathsinlife accordingtotheirtalentsandinterests.
iii. Multidisciplinary andholistic educationacrossthe sciences, social sciences,arts,humanities,and sportsfor amultidisciplinaryworld.
iv. Emphasisonconceptualunderstandingratherthanrotelearning,criticalthinkingtoencouragelogical decision-makingandinnovation;ethicsandhuman&constitutionalvalues,andlifeskillssuchascommunication,teamwork,leadership,andresilience.
v. Extensiveuseoftechnologyinteachingandlearning,removinglanguagebarriers, increasing access for Divyang students, and educational planning andmanagement.
vi. Respect for diversity and respect for the local context in all curricula, pedagogy,and policy.
vii. Equity and inclusion as the cornerstone of all educational decisions to ensurethatallstudentscanthriveintheeducationsystemandtheinstitutionalenvironmentareresponsivetodifferencestoensurethathigh-qualityeducationisavailableforall.
viii. RootednessandprideinIndia,anditsrich,diverse,ancient,andmodernculture,languages,knowledgesystems,and traditions.

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 anaesthesiologist. 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 three 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.

Approachto Curricular Planning:

CreditsinIndianContext:

ChoiceBasedCreditSystem(CBCS)ByUGC

Under the CBCS system, the requirement for awarding a degree or diploma or certificateisprescribedintermsofnumberofcreditstobeearnedbythestudents.Thisframework is being implemented in several universities across States in India. The mainhighlightsofCBCS areasbelow:

- TheCBCSprovidesflexibilityindesigningcurriculumandassigningcreditsbasedonthecourseconte ntandlearninghours.
- TheCBCSprovidesfora systemwhereinstudentscantakecoursesoftheirchoice, learn at their own pace, undergo additional courses and acquire morethantherequiredcredits,andadoptaninterdisciplinaryapproach tolearning.
- CBCSalsoprovidesopportunityforverticalmobilitytostudentsfromabachelor's degreeprogrammeto mastersandresearch degreeprogrammes.

Definitions

AcademicCredit:

An academic credit is a unit by which a course is weighted. It is fixed by the number ofhoursofinstructionsofferedper week.Asper theNationalCreditFramework

1Credit=30NOTIONALCREDITHOURS(NCH)

YearlyLearningHours=1200 NotionalHours(@40 Creditsx30NCH)

30NotionalCreditHours		
Lecture/Tutorial	**Practicum**	**ExperientialLearning**
1 Credit = 15 -22 LectureHours	10-15 PracticumHours	0-8 Experiential LearningHours

Course ofStudy:

Courseofstudyindicatepursuanceofstudyinaparticulardiscipline/programme.Discipline/ProgrammeshallofferMajorCourses(Core),MinorCourses,SkillEnhancementCourses(SEC),ValueAddedCourses(VAC),AbilityEnhancementCompulsoryCourses(AECCs)andInterdisciplinarycourses.

DisciplinaryMajor:

The major would provide the opportunity for a student to pursue in-depth study of aparticular subject or discipline. Students may be allowed to change major within thebroad discipline at the end of the second semester by giving her/him sufficient time toexploreinterdisciplinarycoursesduringthefirstyear.Advanced-leveldisciplinary/interdisciplinarycourses,acourseinresearchmethodology,andaproject/dissertation will be conducted in the seventh semester. The final semester willbedevotedtoseminarpresentation,preparation,andsubmissionofprojectreport/dissertation. The project work/dissertation will be on a topic in the disciplinaryprogrammeofstudyoraninterdisciplinarytopic.

Disciplinary/interdisciplinaryminors:

Studentswillhavetheoptiontochoosecoursesfromdisciplinary/interdisciplinaryminors and skill-based courses. Students who take a sufficient number of courses in adiscipline or an interdisciplinary area of study other than the chosen major will qualifyfor a minor in that discipline or in the chosen interdisciplinary area of study. A studentmay declare the choice of the minor at the end of the second semester, after exploringvariouscourses.

CoursesfromOtherDisciplines(Interdisciplinary):

All UG students are required to undergo 3 introductory-level courses relating to any ofthebroaddisciplinesgivenbelow.Thesecoursesareintendedtobroadentheintellectualexperienceandformpartofliberalartsandscienceeducation.Studentsare notallowedtochoose orrepeatcoursesalreadyundergone atthe higher secondarylevel(12^{th}class)intheproposedmajor and minorstream under thiscategory.

i. NaturalandPhysicalSciences:StudentscanchoosebasiccoursesfromdisciplinessuchasNatural Science,forexample,Biology,Botany,Zoology,Biotechnology,Biochemistry,Chemistry,Physics, Biophysics,AstronomyandAstrophysics,Earthand EnvironmentalSciences,etc.

ii. Mathematics,Statistics,andComputerApplications:Coursesunderthiscategory will facilitate the students to use and apply tools and techniques in theirmajor and minor disciplines. The course may include training in programmingsoftware like Python among others and applications software like STATA, SPSS,Tally, etc. Basic courses under this category will be

helpful for science and socialsciencein dataanalysisandtheapplicationofquantitativetools.

iii. Library, Information, and Media Sciences: Courses from this category willhelpthestudentstounderstandtherecentdevelopmentsininformationandmediascience(journalism,massmedia,andcommunication)

iv. CommerceandManagement:Coursesincludebusinessmanagement,accountancy,finance,financial institutions,fintech,etc.,

v. Humanities and Social Sciences: The courses relating to Social Sciences, forexample,Anthropology,CommunicationandMedia,Economics,History,Linguistics, Political Science, Psychology, Social Work, Sociology, etc. will enablestudents to understand the individuals and their social behaviour, society, andnation. Students be introduced to survey methodology and available large-scaledatabasesforIndia.Thecoursesunderhumanitiesinclude,forexample,Archaeology,History,ComparativeLiterature,Arts&Creativeexpressions,CreativeWritingandLiterature,language(s),Philosophy,etc.,andinterdisciplinary courses relating to humanities. The list of Courses can includeinterdisciplinarysubjectssuchasCognitiveScience,EnvironmentalScience,Gender Studies, Global Environment & Health, International Relations, PoliticalEconomyandDevelopment,SustainableDevelopment,Women's,andGenderStudies,etc.willbeusefultounderstand society.

1.3.6.

AbilityEnhancementCourses(AEC): ModernIndianLanguage(MIL)&Englishlanguagefocusedonlanguageandcommunicationskills.Studentsarerequiredtoachievecompetencyina ModernIndianLanguage(MIL)andintheEnglish language with special emphasis on language and communication skills. Thecourses aim at enabling the students to acquire and demonstrate the core linguisticskills, including critical reading and expository and academic writing skills, that helpstudents articulate their arguments and present their thinking clearly and coherentlyand recognize the importance of language as a mediator of knowledge and identity.Theywouldalsoenablestudentstoacquaintthemselveswiththeculturalandintellectual heritage of the chosen MIL and English language, as well as to provide areflective understanding of the structure and complexity of the language/literaturerelated to both the MIL and English language. The courses will also emphasize thedevelopment and enhancement of skills such as communication, and the ability toparticipate/conductdiscussionanddebate.

1.3.7.SkillEnhancementCourse(SEC): Thesecoursesareaimedatimpartingpractical skills, hands-on training, soft skills, etc., to enhance the employability ofstudents and should be related to Major Discipline. They will aim at providing hands-on training, competencies, proficiency, and skill to students. SEC course will be abasketcoursetoprovideskill-basedinstruction.Forexample,SECofEnglishDisciplinemayincludePublicSpeaking,Translation&Edi

ting and Contentwriting.

A student shallhave the choice tochoose froma list, adefined track of coursesofferedfrom1st to3rd semester.

1.3.8.Value-AddedCourses(VAC):

i. Understanding India: The course aims at enabling the students to acquire anddemonstrate the knowledge and understanding of contemporary India with itshistorical perspective, the basic framework of the goals and policies of nationaldevelopment,andtheconstitutionalobligationswithspecialemphasisonconstitutional values and fundamental rights and duties. The course would alsofocusondevelopinganunderstandingamongstudent-teachersoftheIndianknowledge systems, the Indian education system, and the roles and obligations ofteacherstothenationingeneralandtotheschool/community/society.Thecoursewillattempttodeepenknowledgeaboutandunderstandingof India'sfreedom struggle and of the values and ideals that it represented to develop anappreciationofthecontributionsmadebypeopleofallsectionsandregionsofthe country, and help learners understand and cherish the values enshrined in theIndian Constitution and to prepare them for their roles and responsibilities aseffectivecitizensofademocraticsociety.

ii. Environmental science/education:The course seekstoequip studentswiththe ability toapply theacquired knowledge, skills, attitudes, and valuesrequiredtotakeappropriateactionsformitigatingtheeffectsofenvironmentaldegradation,climatechange,andpollution,effectivewastemanagement,conservation of biological diversity, management of biological resources, forestand wildlife conservation, and sustainable development and living. The course willalsodeepentheknowledgeandunderstandingofIndia'senvironmentinitstotality, its interactive processes, and its effects on the future quality of people'slives.

iii. Digital and technological solutions: Courses in cutting-edge areas that arefast gaining prominences, such as Artificial Intelligence (AI), 3-D machining, bigdataanalysis,machinelearning,dronetechnologies,andDeeplearningwithimportant applications to health, environment, and sustainable living that will bewovenintoundergraduateeducationforenhancingtheemployabilityoftheyouth.

iv. Health & Wellness, Yoga education, sports, and fitness: Course componentsrelatingtohealthandwellnessseektopromoteanoptimalstateofphysical,emotional, intellectual, social, spiritual, and environmental well-being of a person.Sportsandfitnessactivitieswillbe organizedoutside the regularinstitutionalworking hours. Yoga education would focus on preparing the students physicallyand mentally for the integration of their physical, mental, and spiritual faculties,and equipping them with basic knowledge about one's

personality, maintainingself-discipline and self-control, to learn to handle oneself well in all life situations.Thefocusofsportsandfitnesscomponentsofthecourseswillbeontheimprovementofphysicalfitnessincludingtheimprovementofvariouscomponentsofphysicalandskills-relatedfitnesslikestrength,speed,coordination,endurance,andflexibility;acquisitionofsportsskillsincludingmotorskillsaswellasbasicmovementskillsrelevanttoaparticularsport;improvementoftactical abilities;andimprovementofmental abilities. These are a common pool of courses offered by different disciplines and aimedtowards embedding ethical, cultural and constitutional values; promote criticalthinking.Indianknowledgesystems;scientific temperamentofstudents.

1.3.9. Summer Internship /Apprenticeship:

The intention is induction into actual work situations. All students must undergo internships / Apprenticeships in a firm, industry, or organization or Training in labs with faculty and researchers in their own or other HEIs/research institutions during the summer term. Students should take up opportunities for internships with local industry, business organizations, health and allied areas, local governments (such as panchayats, municipalities), Parliament or elected representatives, media organizations, artists, crafts persons, and a wide variety of organizations so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability. Students who wish to exit after the first two semesters will undergo a 4-credit work-based learning/internship during the summer term to get a UG Certificate. **1.3.9.1. Community engagement and service:**

The curricular component of 'community engagement and service' seeks to expose students to the socioeconomic issues in society so that the theoretical learnings can be supplemented by actual life experiences to generate solutions to real-life problems. This can be part of summer term activity or part of a major or minor course depending upon the major discipline.

1.3.9.2. Field-based learning/minor project: The field-based learning/minor project will attempt to provide opportunities for students to understand the different socio-economic contexts. It will aim at giving students exposure to development-related issues in rural and urban settings. It will provide opportunities for students to observe situations in rural and urban contexts, and to observe and study actual field situations regarding issues related to socioeconomic development. Students will be given opportunities to gain a first hand understanding of the policies, regulations, organizational structures, processes, and programmes that guide the development process. They would have the opportunity to gain an understanding of the complex socio-economic problems in the community, and innovative practices required to generate solutions to the identified problems. This may be a summer term project or part of a major or minor course depending on the subject of study.

1.3.10. Indian Knowledge System: In view of the importance accorded in the NEP 2020 to rooting our curricula and pedagogy in the Indian context all the students who are enrolled in the four-year UG programmes should be encouraged to take an adequate number of courses in IKS

so that the total credits of the courses taken in IKS amount to at least five per cent of the total mandated credits (i.e. min. 8 credits for a 4 yr. UGP & 6 credits for a 3 yr. UGP). The students may be encouraged to take these courses, preferably during the first four semesters of the UG programme. At least half of these mandated credits should be in courses in disciplines which are part of IKS and are related to the major field of specialization that the student is pursuing in the UG programme. They will be included as a part of the total mandated credits that the student is expected to take in the major field of specialization. The rest of the mandated credits in IKS can be included as a part of the mandated Multidisciplinary courses that are to be taken by every student. All the students should take a Foundational Course in Indian Knowledge System, which is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. The foundational IKS course should be broad-based and cover introductory material on all aspects.

1.3.10. Indian Knowledge System: In view of the importance accorded in the NEP 2020 to rooting our curricula and pedagogy in the Indian context all the students who are enrolled in the four-year UG programmes should be encouraged to take an adequate number of courses in IKS so that the total credits of the courses taken in IKS amount to at least five per cent of the total mandated credits (i.e. min. 8 credits for a 4 yr. UGP & 6 credits for a 3 yr. UGP). The students may be encouraged to take these courses, preferably during the first four semesters of the UG programme. At least half of these mandated credits should be in courses in disciplines which are part of IKS and are related to the major field of specialization that the student is pursuing in the UG programme. They will be included as a part of the total mandated credits that the student is expected to take in the major field of specialization. The rest of the mandated credits in IKS can be included as a part of the mandated Multidisciplinary courses that are to be taken by every student. All the students should take a Foundational Course in Indian Knowledge System, which is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. The foundational IKS course should be broad-based and cover introductory material on all aspects

1.3.11. Experiential Learning: One of the most unique, practical & beneficial features of the National Credit Framework is assignment of credits/credit points/ weightage to the experiential learning including relevant experience and professional levels acquired/ proficiency/ professional levels of a learner/student. Experiential learning is of two types:

a. Experiential learning as part of the curricular structure of academic or vocational program. E.g., projects/OJT/internship/industrial attachments etc. This could be either within the Program- internship/ summer project undertaken relevant to the program being studied or as a part time employment (not relevant to the program being studied- up to certain NSQF level only). In case where experiential learning is a part of the curricular structure the credits would be calculated and assigned as per basic principles of NCrF i.e., 40 credits for 1200 hours of

notional learning.

b. Experiential learning as active employment (both wage and self) post completion of an academic or vocational program. This means that the experience attained by a person after undergoing a particular educational program shall be considered for assignment of credits. This could be either Full or Part time employment after undertaking an academic/ Vocation program. In case where experiential learning is as a part of employment the learner would earn credits as weightage. The maximum credit points earned in this case shall be double of the credit points earned with respect to the qualification/ course completed. The credit earned and assigned by virtue of relevant experience would enable learners to progress in their career through the work hours put in during a job/employment

AwardofDegree

The structure and duration of undergraduate programmes of study offered by the University as per NEP 2020 include:

2.1. Undergraduate programmes of either 3 or 4-year duration with Single Major, with multiple entry and exit options, with appropriate certifications:

2.1.1. UG Certificate: Students who opt to exit after completion of the first year and have secured 40 credits will be awarded a UG certificate if, in addition, they complete one vocational course of 4 credits during the summer vacation of the first year. These students are allowed to re-enter the degree programme within three years and complete the degree programme within the stipulated maximum period of seven years.

2.1.2. UG Diploma: Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the UG diploma if, in addition, they complete one vocational course of 4 credits during the summer vacation of the second year. These students are allowed to re-enter within a period of three years and complete the degree programme within the maximum period of seven years.

2.1.3. 3-year UG Degree: Students who will undergo a 3-year UG programme will be awarded UG Degree in the Major discipline after successful completion of three years, securing 120 credits and satisfying the minimum credit requirement.

***2.1.4. 4-year UG Degree (Honours*)**: A four-year UG Honours degree in the major discipline will be awarded to those who complete a four-year degree programme with 160 credits and have satisfied the credit requirements as given in Table 6 in Section 5.

2.1.5. 4-year UG Degree (Honours with Research): Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research project or dissertation under the guidance of a Faculty Member of the University. The research project/dissertation will be in the major discipline. The students who secure 160 credits, including 12 credits from a research project/dissertation, will be awarded UG Degree (Honours with Research).

Table: 1: Award of Degree and Credit Structure with ME-ME

Award	Year	Credits toearn	Additional Credits	Re-entry allowedwithin(yrs)	Years toComplete
UGCertificate	1	40	4	3	7
UGDiploma	2	80	4	3	7
3-yearUGDegree(Major)	3	120	x	x	x
4-year UG Degree(Honours)	4	160	x	x	x

Award	Year	Credits toearn	Additional Credits	Re-entry allowedwithin(yrs)	Years toComplete
4-yearUGDegree (Honors withResearch):	4	160	Studentswhosecurecumulative75% marksandaboveinthefirstsixsemesters		

Credit,CreditPoints&Credithoursfordifferenttypes Ofcourses

3.1.Introduction:

'Credit'isrecognitionthatalearnerhascompletedapriorcourseoflearning,corresponding to a qualification at a given level. For each such prior qualification, thestudent would have put in a certain volume of institutional or workplace learning, andthe more complex a qualification, the greater the volume of learning that would havegoneintoit.Creditsquantifylearningoutcomesthataresubjectachievingtheprescribedlearningoutcomestovalid,reliablemethodsofassessment.

The ***credit points*** will give the learners, employers, and institutions a mechanism fordescribing and comparing the learning outcomes achieved. The credit points can becalculatedascreditsattainedmultiplied with thecreditlevel.

The workload relating to a course is measured in terms of credit hours. A credit is a unitby which the coursework is measured. It determines the number of hours of instructionrequiredperweekoverthedurationofasemester(minimum15weeks).

Eachcoursemayhaveonlyalecturecomponentoralectureandtutorialcomponentora lecture and practicum component or a lecture, tutorial, and practicum component, oronlypracticumcomponent.RefertotheSection 1.3.1

A course can have a combination of ***lecture credits, tutorial credits, practicum creditsandexperientiallearningcredits.***

The following types of courses/activities constitute the programmes of study. Each ofthemwillrequireaspecificnumberofhoursofteaching/guidanceandlaboratory/studio/workshop activities, field-based learning/projects, internships, andcommunityengagement andservice.

- **Lecture courses:** Courses involving lectures relating to a field or discipline by anexpert or qualified personnel in a field of learning, work/vocation, or professionalpractice.
- **Tutorial courses:** Courses involving problem-solving and discussions relating to afield or discipline under the guidance of qualified personnel in a field of learning,work/vocation, or professionalpractice.Should also refer tothe RemedialClasses,flip classrooms and focus on both Slow and Fast Learners of the class according totheirmerit.

- **PracticumorLaboratorywork:**Acourse requiringstudentstoparticipateinaprojectorpracticalorlabactivitythatappliespreviouslylearned/studiedprinciples/theoryrelatedtothechosenfieldoflearning,work/vocation,orprofessional practice under the supervision of an expert or qualified individual in thefieldoflearning,work/vocationor professionalpractice.
- **Seminar:**Acourserequiringstudentstoparticipateinstructureddiscussion/conversation or debate focused on assigned tasks/readings, current orhistoricalevents,orsharedexperiencesguidedorledbyanexpertorqualifiedpersonnel inafieldoflearning,work/vocation,or professional practice.
- **Internship:** A course requiring students to participate in a professional activity orwork experience, or cooperative education activity with an entity external to theeducationinstitution,normallyunderthesupervisionofanexpertofthegivenexternal entity. A key aspect of the internship is induction into actual work situations.Internshipsinvolveworkingwithlocalindustry,governmentorprivateorganizations, business organizations, artists, crafts persons, and similar entities toprovideopportunities forstudentsto activelyengageinon-siteexperientiallearning.
- **Studio activities:** Studio activities involve the engagement of students in creative orartistic activities. Every student is engaged in performing a creative activity to obtainaspecificoutcome.Studio-basedactivitiesinvolvevisual-oraesthetic-focusedexperiential work.
- **Fieldpractice/projects:**Coursesrequiring studentstoparticipateinfield-basedlearning/projects generally under the supervision of an expert of the given externalentity.
- **Community engagement and service:** Courses requiring students to participate infield-basedlearning/projects generallyunder the supervision ofanexpertofthegivenexternalentity.Thecurricularcomponentof‘communityengagementandservice’ willinvolveactivitiesthatwouldexposestudentstothesocio-economicissues in society so that the theoretical learnings can be supplemented by actual lifeexperiencestogeneratesolutionstoreal-lifeproblems.

Table 2:Coursewise DistributionofCredits

BroadCategoryofCourse	**MinimumCreditRequirement**	
	3-yearUG	**4-YearUG**
Major(Core)	60	80
MinorStream	24	32
Interdisciplinary	9	9
AbilityEnhancement Courses(AEC)	8	8

SkillEnhancement Courses (SEC)	9	9
ValueAddedCoursescommonforallUG	6	6
SummerInternship	4	4
ResearchProject/Dissertation	NA	12
Total	**120**	**160**

Table3:CreditDistributionfor3-yearCourse

Semester	CourseCredits							
	Major	**Minor**	**ID**	**AEC**	**SEC**	**VAC**	**SI**	**Total**
I	6	3	3	2	3	3	0	**20**
II	6	3	3	2	3	3	0	**20**
III	8	4	3	2	3	0	0	**20**
IV	12	6	0	2	0	0	0	**20**
V	12	4	0	0	0	0	4	**20**
VI	16	4	0	0	0	0	0	**20**
	60	**24**	**9**	**8**	**9**	**6**	**4**	**120**

Table 4:CreditDistributionfor4-yearCourse

Semester	CourseCredits								Total
	Major	**Minor**	**ID**	**AEC**	**SEC**	**VAC**	**SI**	**RP**	
I	6	3	3	2	3	3	0	0	**20**
II	6	3	3	2	3	3	0	0	**20**
III	8	4	3	2	3	0	0	0	**20**
IV	12	6	0	2	0	0	0	0	**20**
V	12	4	0	0	0	0	4	0	**20**
VI	16	4	0	0	0	0	0	0	**20**
VII	16	4	0	0	0	0	0	0	**20**
VIII	4	4	0	0	0	0	0	12	**20**

	80	**32**	**9**	**8**	**9**	**6**	**4**	**12**	**160**

LevelofCourses

4.1 NHEQF levels:

The NHEQF levels represent a series of sequential stages expressed in terms of a rangeoflearningoutcomesagainstwhichtypicalqualificationsarepositioned/located.NHEQF level 4.5 represents learning outcomes appropriate to the first year (first twosemesters) of the undergraduate programme of study, while Level 8 represents learningoutcomesappropriatetothedoctoral-levelprogrammeofstudy.

Table:5:NHEQFLevels

NHEQF level	**Examples of higher education qualifications located withineachlevel**	**CreditRequirements**
Level 4.5	UndergraduateCertificate.Programmeduration:Firstyear(firsttwo semesters) of the undergraduate programme, followed byan exit4-creditskills-enhancementcourse(s).	40
Level 5	Undergraduate Diploma. Programme duration: First two years(first foursemesters)oftheundergraduateprogramme, followed by an exit 4-credit skills-enhancement course(s)lasting twomonths.	80
Level 5.5	Bachelor'sDegree.Programmeduration:Firstthreeyears(Six semesters)ofthefour-yearundergraduateprogramme.	120
Level 6	Bachelor'sDegree(Honours/HonourswithResearch). Programmeduration:Fouryears(eightsemesters).	160
Level 6	Post-Graduate Diploma. Programme duration: One year (twosemesters)forthosewhoexitaftersuccessfulcompletionofthefirstyear(twosemesters)ofthe2-yearmaster'sprogramme	160
Level 6.5	Master's degree. Programme duration: Two years (foursemesters)afterobtaininga 3-yearBachelor'sdegree(e.g.B.A.,B.Sc.,B.Com.etc.).	80
Level 6.5	Master's degree. Programme duration: One year (twosemesters) after obtaining a 4 -year Bachelor's degree(Honours/HonourswithResearch)(e.g.B.A.,B.Sc., B.Com.etc.).	40
Level 7	Master's degree. (e.g., M.E./M.Tech. etc.) Programme duration:Two years (four semesters) after obtaining a 4-year Bachelor'sdegree.(e.g.,B.E./B.Tech.etc.)	80
Level 8	DoctoralDegree	Credits forcourse work,Thesis, and published work

4.2.CourseCodebasedonLearningOutcomes:

Courses are coded based on the learning outcomes, level of difficulty, and academicrigor.Thecodingstructureisasfollows:

i. 0-99: ***Pre-requisite courses*** required to undertake an introductory course which willbe a pass or fail course with no credits. It will replace the existing informal way ofoffering bridgecoursesthatareconducted insomeofthecolleges/universities.

ii. 100-199: ***Foundation or introductory courses*** that are intended for students to gainanunderstandingandbasicknowledgeaboutthesubjectsandhelpdecidethesubjector discipline of interest. These courses may also be prerequisites for courses in themajor subject. These courses generally would focus on foundational theories, concepts,perspectives,principles,methods,andproceduresofcriticalthinkinginordertoprovideabroad basisfor takingupmoreadvancedcourses.

iii. 200-299: ***Intermediate-level courses*** including subject-specific courses intended tomeet the credit requirements for minor or major areas of learning. These courses can bepartofamajor and canbepre-requisitecoursesfor advanced-level majorcourses.

iv. 300-399:*Higher-levelcourses*whicharerequiredformajoringinadisciplinary/interdisciplinaryareaofstudyfortheawardofadegree.

v. ***400-499: Advanced courses*** which would include lecture courses with practicum,seminar-basedcourse,termpapers,researchmethodology,advancedlaboratoryexperiments/softwaretraining,researchprojects,hands-on-training,internship/apprenticeshipprojectsattheundergraduatelevelorFirstyearpost-graduatetheoreticalandpracticalcourses.

vi. 500-599: ***Courses at first-year PG degree level*** for a 2-year post-graduate degreeprogramme

vii. 600-699: ***Courses for second year of 2-year PG*** or 1-year post-graduate degreeprogramme

viii. 700-799&above: Courseslimitedtodoctoralstudents.

Section5

CourseStructureoftheFramework

Table6.Semesterwiseandcomponentwisedistributionofcredit(FourYearUGP-SingleMajor) [6]

Year	Semester	Component	Cousecode	Number ofCourses	Credit perCourse	Total creditin thecomponent
FirstYear	I	Major(Core)	C-101,C-102	2	3	6
		Minor (May or may not berelatedtomajor)	M-101	1	3	3
		Interdisciplinary	IDC-1	1	3	3
		AEC1-Language	AEC-1	1	2	2
		SEC- (To choose from a pool ofcourses.ToberelatedtoMajor)	SEC-1	1	3	3
		VAC- (To choose from a pool ofcourses)	VAC-1	1	3	3
				7		**20**
	II	Major(Core)	C-103,C-104	2	3	6
		Minor (May or may not berelatedtomajor)	M102	1	3	3
		Interdisciplinary	IDC-2	1	3	3
		AEC1-Language	AEC-2	1	2	2
		SEC (Tochoosefromapoolof courses.Tobe relatedtoMajor)	SEC-2	1	3	3
		VAC- (Choose from a pool ofcourses)	VAC-2	1	3	3
				7		**20**
SecondYear	III	Major(Core)	C-201,C-202	2	4	8
		Minor (May or may not berelatedtomajor)	M-201	1	4	4
		Interdisciplinary	IDC-3	1	3	3
		AEC1-Language	AEC-3	1	2	2
		SEC- (To choose from a pool ofcourses.ToberelatedtoMajor)	SEC-3	1	3	3
				6		**20**
	IV	Major(Core)	C-203, C-204,C-205	3	4	12
		Minor (May or may not berelatedtomajor)	M-202,M-203	2	3	6

		AEC1-Language	AEC-4	1	2	2
				6		**20**

Year	Semester	Component	Cousecode	Number ofCours es	Credit perCo urse	Total creditin thecompone nt
ThirdYear	V	Major(Core)	C-301, C-302,C-303	3	4	12
		Minor (May or may not berelatedtomajor)	M-301	1	4	4
		Internship		1	4	4
				5		**20**
	VI	Major(Core)	C-304, C-305,C-306,C-307	4	4	16
		Minor (May or may not berelatedtomajor)	M-302	1	4	4
				5		**20**
FourthYear	VII	Major(Core)	C-401, C-402,C-403,C-404	4	4	16
		Minor (May or may not berelatedtomajor)	M-401	1	4	4
				5		**20**
	VIII	Major(Core)	C-405 (RM-301)	1	4	4
		ResearchMethodology	M-402	1	4	4
		Dissertation/ResearchProject		1	12	12
		Or 400 level advanced course Core(inlieuof Dissertation/Research Project)	C-407, C-408,C-409	3	4	
				3/5		**20**

GraduateAttributes&LearningOutcomes

Introduction

As per the NHEQF, each student on completion of a programme of study must possessanddemonstratetheexpected***GraduateAttributes***acquiredthroughoneormoremodes of learning, including direct in-person or face-to-face instruction, online learning,and hybrid/blended modes. The graduate attributes indicate the quality and features orcharacteristics of the graduate of a programme of study, including learning outcomesrelating to the disciplinary area(s) relating to the chosen field(s) of learning and genericlearning outcomes that are expected to be acquired by a graduate on completion of theprogramme(s)ofstudy.

Thegraduateprofile/attributesmustinclude,

- capabilities thathelpwidenthecurrentknowledgebaseandskills,
- gainand applynew knowledgeandskills,
- undertakefuturestudiesindependently,performwellinachosencareer,and
- playaconstructiveroleasaresponsiblecitizeninsociety.

Thegraduateprofile/attributesareacquiredincrementallythroughdevelopmentofcognitive levels and describe a set of competencies that are transferable beyond thestudy of a particular subject/disciplinary area and programme contexts in which theyhavebeendeveloped.

Graduateattributes include,

- ***learningoutcomesthatarespecifictodisciplinaryareas***relatingtothechosenfield(s)oflearningwithinbroadmultidisciplinary/interdisciplinary/transdisciplinary contexts.
- ***generic learning outcomes*** that graduate of all programmes of study shouldacquireanddemonstrate.

GraduateAttributes:

Table:7:TheLearningOutcomesDescriptorsandGraduateAttributes

Sl.no.	**GraduateAttribute**	**TheLearningOutcomesDescriptors *(Thegraduatesshouldbeabletodemonstratethecapability to:)***
GA1	DisciplinaryKnowledge	acquireknowledgeandcoherentunderstanding ofthechosendisciplinary/interdisciplinaryareasofstudy.

Sl.no.	GraduateAttribute	**TheLearningOutcomesDescriptors** ***(Thegraduatesshouldbeabletodemonstratethecapabilityto:)***
GA2	Complex problemsolving	solvedifferentkindsofproblemsinfamiliarandnon-familiarcontextsandapplythelearningto real-lifesituations.
GA3	Analytical&Critical thinking	apply analytical thought including the analysisand evaluation of policies, and practices. Able toidentify relevant assumptions or implications.Identifylogicalflawsandholesintheargumentsof others. Analyse and synthesize data from avarietyofsources anddraw validconclusions andsupportthemwithevidenceandexamples.
GA4	Creativity	create, perform, or think in different and diverseways about the same objects or scenarios anddeal with problems and situations that do nothave simple solutions. Think 'out of the box' andgenerate solutions to complex problems inunfamiliarcontexts byadoptinginnovative, imaginative,lateralthinking,interpersonalskills,and emotionalintelligence.
GA5	Communicatio nSkills	listen carefully, read texts and research papersanalytically,andpresentcomplex informationina clear and concise manner to differentgroups/audiences. Express thoughts and ideaseffectivelyinwritingandorallyandcommunicate withothersusingappropriatemedia.
GA6	Research-relatedskills	developakeensenseofobservation,inquiry,andcapability for asking relevant/ appropriatequestions. Should acquire the ability toproblematize, synthesize and articulate issuesand design research proposals, define problems,formulate appropriate and relevant researchquestions,formulatehypotheses,testhypothesesusing quantitative and qualitative data, establishhypotheses, make inferences based on theanalysis and interpretation of data, and predictcause-and-effect relationships. Should developthe ability to acquire the understanding of basicresearch ethicsandskillsinpracticing/doing ethicsinthefield/inpersonalresearchwork.
GA7	Collaboration	work effectively and respectfully with diverseteams intheinterestsofacommoncauseand workefficientlyas amemberofateam.

GA8	Leadershipreadiness/qualities	plan the tasks of a team or an organization andsettingdirectionbyformulating aninspiring vision and building a team that can help achievethevision.
GA9	Digitaland technological skills	useICT inavarietyoflearning andwork situations. Access, evaluate, and use a variety of relevant information sources and use appropriate software for analysis of data.
GA 10	Environmental awareness and action	mitigate the effects of environmental degradation, climate change, and pollution. Should develop the technique of effective waste management, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living.

Programme Learning Outcomes in B.Sc. Operation Theatre Technology

Program LearningOutcomes (PLO)

PLO1:Knowledge of Operation Theatre Technology

Possess an acquired scientific knowledge to become a healthcare professional.

PLO2: Develop complex problemsolving skills

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

PLO3: Develop analytical&Critical thinking skills

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

PLO4:Develop the ability to create

Possess creative skills to deal with difficult scenarios by adopting ingenious ways of achieving the goals without compromising the desired outcome.

PLO5:Develop effective CommunicationSkills

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.

PLO6:Developresearch-related skills

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

PLO7:Develop the capability of team building

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

PLO8: Develop leadershipreadiness/qualities

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

PLO9:Develop digitaland technological skills

Ability to use ICT in variety of situations and possess learning and applying digitally.

PLO10: - Develop environmental awareness andaction

Possess knowledge and technicality to raise awareness for the benefit of the society.

Programme Specific Outcomes (PSO):

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

PSO 3: This Program will create a great source of manpower which can, 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. 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.

TheQualificationSpecifications:

Table:8:NHEQFQualificationspecifications

Qualificationtype	Purposeof thequalification
UndergraduateCertificate	The students will be able to apply technical and theoreticalconceptsandspecializedknowledgeandskillsinabroadrange ofcontexts toundertakeskilledorparaprofessional work and/ortopursuefurtherstudy/learningathigherlevels.
UndergraduateDiploma	The students will be able to apply specialized knowledge in arangeofcontextstoundertakeadvanced skilledor paraprofessionalworkand/ortopursuefurtherlearning/studyathigherlevels.
Bachelor'sdegree	Thestudentswillbeabletoapplyabroadand coherentbodyof knowledgeandskills inarangeofcontextstoundertakeprofessional workand/or for further learning.
	Thestudentswillbeabletoapplytheknowledgeinaspecific context to undertake professional work and for research andfurther learning.

Bachelor's degree(Honours/ HonourswithResearch)	The students will be able to apply an advanced body of knowledgein a range of contexts to undertake professional work and applyspecialized knowledge and skills for research and scholarship,and/orfor furtherlearningrelating tothechosenfield(s)of learning,work/vocation,orprofessionalpractice.
Master'sdegree (1year/2semestersofstudy)	The students will be able to apply an advanced body of knowledgein a range of contexts for professional practice, research, andscholarshipand asapathwayfor furtherlearning.Graduatesat this level are expected to possess and demonstrate specializedknowledgeandskillsforresearch,and/orprofessionalpractice and/or for further learning.
Master's degree (2 years /4 semesters of study)	The students will be able to apply an advanced body of knowledge in a range of contexts for professional practice, research, and scholarship and as a pathway for further learning. Graduates at this level are expected to possess and demonstrate specialized knowledge and skills for research, and/or professional practice and/or for further learning. Master's degree holders are expected to demonstrate the ability to apply the established principles and theories to a body of knowledge or an area of professional practice.
Doctoral degree	The Doctoral degree qualifies students who can ask relevant and new questions and develop appropriate methodologies and tools for collecting information in pursuit of generating new knowledge and new data sets; and apply a substantial body of knowledge to undertake research and investigations to generate new knowledge, in one or more fields of inquiry, scholarship or professional practice. Graduates at this level is expected to have a systematic and critical understanding of a complex field of learning and specialized research skills for the advancement of knowledge and/or professional practice and making a significant and original contribution to the creation of new knowledge relating to a field of learning or in the context of an area of professional practice.

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.

Assessment Method

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: -

	Component of Evaluation	**Marks**	**Frequency**	**Code**	**Weightage (%)**
A	**Continuous Evaluation**				

i	Analysis/Class test	Combination of any three from (i) to (v) with 5 marks each	1-3	C	25%
ii	Home Assignment		1-3	H	
iii	Project		1	P	
iv	Seminar		1-2	S	
v	Viva-Voce/Presentation		1-2	V	
vi	MSE	MSE shall be of 20 marks	1-3	Q/CT	
vii	Attendance	Attendance shall be of 5 marks	100%	A	5%
B	Semester End Examination		1	SEE	70%
	Project				**100%**

Programme Structure

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**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M101/ OTT242M111	Anatomy-I (Theory & Practical)	100	3
2	OTT242M102/ OTT242M112	Physiology- I (Theory & Practical)	100	3
Minor Subject				
3	OTT242N101	Hospital Duty and Patient Care	100	3
Interdisciplinary				
4	IKS992K101	IKS-I	100	3
Ability Enhancement Compulsory Courses (AEC)				
5	CEN982A101	Communicative English- I	100	1
6	BHS982A102	Behavioural Science-I	100	1
Skill Enhancement Course (SEC)				
7	OTT242S101/ OTT242S111	SEC-1 Biochemistry(Theory & Practical)	100	3
Value Added Courses (VAC)				
8		VAC-1 Select one course from a basket of course	100	3
		TOTAL		**20**

2nd Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M201/ OTT242M211	Anatomy-II (Theory & Practical)	100	3
2	OTT242M202/ OTT242M212	Physiology- II (Theory & Practical)	100	3
Minor Subject				

3	OTT242N201	Introduction to Operation Theatre	100	3
Interdisciplinary				
4	IKS992K201	IKS-II	100	3
Ability Enhancement Compulsory Courses (AEC)				
5	CEN982A201	Communicative English II	100	1
6	BHS982A202	Behavioural Science-II	100	1
Skill Enhancement Course (SEC)				
7	OTT242S201/ OTT242S211	SEC-2 Surgical Instrumentation	100	3
Value Added Courses (VAC)				
8		VAC-2 Select one course from a basket of course	100	3
		TOTAL		**20**

3rd Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M301/ OTT242M311	Principles of Anesthesia (Theory + Practical)	200	4
2	OTT242M302/ OTT242M312	Basics of OT and Surgical Procedures (Theory + Practical)	200	4
Minor Subject				
3	OTT242N301	Basic techniques of Anesthesia	200	4
Interdisciplinary				
4		IKS-III Select one course from a basket of course	200	3
Ability Enhancement Compulsory Courses (AEC)				
5	CEN982A301	Communicative English III	100	1
6	BHS982A302	Behavioural Science-III	100	1
Skill Enhancement Course (SEC)				
7	OTT242S301	SEC-3 Pharmacology	200	3
		TOTAL		**20**

4th Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M401/ OTT242M411	Airway Management and Respiratory Emergencies(Theory + Practical)	200	4
2	OTT242M402	Microbiology and Pathology	200	4
3	OTT242M403	Fundamentals of Yoga	200	4
Minor Subject				
4	OTT242N401	Medicine Relevant to Operation Theatre	200	3
5	OTT242N402	Cardiovascular Emergencies and Management	200	3
Ability Enhancement Compulsory Courses (AEC)				
6	CEN982A401	Communicative English IV	100	1
7	BHS982A402	Behavioural Science-IV	100	1
		TOTAL		**20**

5th Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M501/ OTT242M511	Specialized anesthesia and surgery(Theory+ Practical)	300	4
2	OTT242M502/ OTT242M512	Basic Life Support and Advance Cardiac Life Support (Theory+ Practical)	300	4
3	OTT242M503	Biostatistics and Research Methodology	300	4
Minor Subject				
4	OTT242N501	Post Operative Care	300	4
Internship				
5		Internship	300	4
		TOTAL		**20**

6th Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
Major Subjects				
1	OTT242M601/OTT242M611	Advance anesthetic techniques (Theory+ Practical)	300	4
2	OTT242M602/ OTT242M612	Intensive Care Unit (Theory+ Practical)	300	4
3	OTT242M603	Medical Emergencies	300	4
4	OTT242M604/ OTT242M614	Post Anesthesia Care (Theory+ Practical)	300	4
Minor Subject				
5	OTT242N601	Basics of ICU	300	4
		TOTAL		**20**

7th Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
1		Internship	400	20
		TOTAL		**20**

8th Semester				
Sl.No.	**Subject Code**	**Names of subjects**	**Course Level**	**Credits**
1		Internship	400	20
		TOTAL		**20**

Bachelor of Operation Theater Technology
1st Semester

Subject Name: Anatomy-I (THEORY& PRACTICAL)
Course type: Major
Course Code: OTT242M101/ OTT242M111
Course Level: 100

L-T-P-C – 2-0-2-3 **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.	**10hours**
II.	**Musculoskeletal System:** • Structure of Bone & its types. • Joints- Classification of joints with examples; details of synovial joint. • Axial skeleton & appendicular skeleton	**10 hours**

	• Bones of appendicular skeleton • Bones of axial skeleton • Locomotor system - bone , cartilage, ligaments and tendons • Skull, spine & its movements, intervertebral disc. Muscles & its types.	
III.	**Gastro-Intestinal System:** • Parts of the GIT - mouth, pharynx, oesophagus, stomach • Abdominal cavity - divisions and regions • Liver • Pancreas • Spleen • Gall Bladder • Intestine (small and large)	**12hours**
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.	**12hours**
TOTAL		**44hours**

ANATOMY-I Practical
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Introduction of the human body. • Organisation of tissues of the body. • Planes of the human body.	**7.5 hours**
II.	• Demonstration of all bones of the human body. • Cavities of the human body. • Body Movement terminology.	**7.5 hours**
III.	• Identification ofthe quadrants and regions of the body. • Arteries and Veins • Bone,muscles (Skeletal, smooth, cardiac)	**7.5 hours**
IV.	• Heart • Kidney • Liver • Stomach	**7.5 hours**
TOTAL		**30 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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&Practical)
Course type: Major
Course Code: OTT242M102/ OTT242M112
Course Level: 100

L-T-P-C – 2-0-2-3 **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.	**10 hours**
II.	**Gastro- Intestinal System** • Physiological Anatomy, functions of GIT. • Salivary Gland-functions of saliva.	**14 hours**

	• 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.	
III.	**Cardiovascular System** • Heart-Physiological Anatomy, Nerve supply, Properties of cardiac muscle. • Cardiac Cycle-Events–systole, diastole. • Cardiac Output-Definition and factors affecting it.	**10hours**
IV.	**Excretory System** • Kidneys-structure of nephron, functions of kidney. • Glomerular filtration Rate(GFR) and factors affecting it. • Urine formation. • Renal function test.	**10hours**
TOTAL		**44hours**

PHYSIOLOGY-I Practical
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Identification of laboratory apparatus. • Study of compound microscope.	**7.5hrs**
II.	• Determination of blood haemoglobin level.	**7.5hrs**
III.	• Determination of bleeding time.	**7.5hrs**
IV.	• Determination of clotting time. • Blood smear preparation staining and differential leukocyte count.	**7.5hrs**
TOTAL		**30 hrs**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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: Hospital Duty and Patient Care (THEORY)
Course type: MINOR
Course Code: OTT242N101
Course Level: 100

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.	**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.	**16 hours**
II.	**First Aid:** • Introduction, Aims & objectives of first aid. • Priorities of first aid.	**18 hours**

	• 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. **Vital Signs of Patients:** • Blood Pressure • Temperature • Pulse • Respiration	
III.	**Hyperglycemia:** • Definition, Clinical features, Diabetes laboratory tests for diabetes. **Hypoglycemia:** • Definition, Etiology & Clinical Features, Investigations for hypoglycemia. **Hemorrhage:** • Internal haemorrhage. • External haemorrhage. **Shock:** • Definition. • Types of shock. • Management of shock. **Poisoning:** • Definition, Causes of poisoning, Sources of Poisoning, Symptoms of poisoning, First aid & Management, Antidotes, Common drugs poisoning, Carbon monoxide poisoning**.**	**14 hours**
IV.	**Drugs:** • Definition, Names & classification of drugs, Different preparations of drugs, Effects of drugs, Adverse effects of drugs, Tolerance, Abuse, addiction of drugs, Different routes of drug administration, Storing of medicine, Units of standard measurement**.**	**12 hours**

	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.	
TOTAL		**60hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60 hours	-	30 hours (Hospital visit, Home assignments, project, seminar)

Text Book:

1. Patient Care Management, A.K. Mohiuddin, Red Flower Publication Pvt. Ltd.
2.Fundamnetals of Hospital Practice and Patient Care, VyakarnamNageshwar,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: Biochemistry
Course type: SEC
Course Code: OTT242S101/ OTT242S111
Course Level: 100

L-T-P-C – 2-0-2-3 **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.	**12 hours**
Total		**44hours**

Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Identifications of instruments and Glasswares.	**7.5hrs**
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.	**7.5hrs**
III.	Qualitative analysis of Proteins - Precipitation Reaction, Heller's Test, Heat and Acidic Test.	**7.5hrs**
IV	Qualitative analysis of Lipids – Solubility test.	**7.5hrs**
		30 hr

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visit, Home assignments, project, seminar)

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.

Bachelor of Operation Theater Technology
2nd Semester

Subject Name: Anatomy- II (THEORY+ PRACTICAL)
Course type: Major
Course Code: OTT242M103/ OTT242M113
Course Level: 100

L-T-P-C – 2-0-2-3 **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.	**11hours**
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.	**11 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	**11hours**
IV.	**Sensory Organs:** • Skin & its appendages. • Structure of eye & lacrimal apparatus, name of extra ocular muscles. • Structure of ear: external, middle & inner ear.	**11 hours**
TOTAL		**44hours**

ANATOMY-II Practical
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Identification of clavicle. • Identification of scapula.	**7.5 hours**
II.	• Identification of the Humerus. • Identification of the Radius. • Identification of Ulna.	**7.5 hours**
III.	• Identification of the femur. • Identification of the tibia. • Identification of the fibula	**7.5 hours**
IV.	• Identification of the bones of the skull • Identification of the vertebral column.	**7.5 hours**
TOTAL		**30 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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& PRACTICAL)
Course type: Major
Course Code: OTT242M104/ OTT242M114
Course Level: 100

L-T-P-C – 2-0-2-4 **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.	**10 hours**
II.	**CentralNervousSystem** • Structure of neuron, functions of nervous system. • Classification and properties of nerve fibres • Synapse- structure and types	**12hours**

	• 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.	
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.	**12 hours**
IV.	**Reproductive System** • Male Reproductive System-Stages of spermatogenesis, function of Testosterone • Female Reproductive System-Ovulation, menstrual cycle, functions of estrogen and progesterone	**10 hours**
TOTAL		**44hours**

PHYSIOLOGY-II (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	Determination of Erythrocyte Sedimentation Rate.	**6 hours**
II.	Determination of Platelet count.	**6 hours**
III.	Qualitative test for ABO grouping.	**6 hours**
IV.	Differential Leukocytes count.	**6 hours**
V.	Determination of Haematocrit.	**6 hours**
VI.	Total Erythrocyte count using a Hemacytometer.	**6 hours**
TOTAL		**30 hrs**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30	16 hours (Hospital visits, Demonstration, Case study)

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: Introduction to Operation Theatre
Course type: Minor
Course Code: OTT242N102
Course Level: 100

L-T-P-C – 3-0-0-3 **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.	**Layout of the OT** **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		**60hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60 hours	-	30 hours (Hospital visits, Demonstration, Case study)

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: Surgical Instrumentation (Theory & Practical)
Course type: SEC
Course Code: OTT242S201/ OTT242S211
Course Level: 100

L-T-P-C – 2-0-2-3 **Scheme of Evaluation: (T/P/TP)**

Objective: The student will be able prepare instrumentsand 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** thevarious 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 **Basic Instruments** • Accessory instruments • **General Instruments**	**11 hours**
II.	**Laparoscopic instruments** • Move to viewing • Probing and dilating instruments **Obstetrics and gynecologic instruments** **Genitourinary instruments** **Ophthalmic instruments**	**11 hours**

III.	**Cardiovascular thoracic instruments** **Neurological instruments** **Orthopedic instruments.**	**11 hours**
IV.	• Surgical set-up • Case preparation • Preparation to set up the sterile file	**11 hours**
TOTAL		**44 hours**

Operation Theatre Technology- Surgical Instrumentation (Practical)
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Demonstration of job description of various members of Surgical team. • Technique of using Pneumatic Tourniquet. • Technique of insertion of Urinary Catheter • Skin preparation	**7.5 hours**
II.	• Technique of Insertion of IV Cannula. • Technique of insertion of Ryle's Tube. • Drapes and draping	**7.5 hours**
III.	• Demonstration of Transportation of Patient. • Technique of Blood Transfusion & Collection. • Patient Positioning demonstration.	**7.5 hours**
IV	• Insertion & removal technique of Drains. • Techniques of Suturing. • Preoperative preparation of the patient	**7.5 hours**
TOTAL		**30hr**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44	30	16 hours (Hospital visits, Demonstration, Case study)

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.
3. Operation theatre techniques and Management, MP Sharma, AITBS publishers.
4.

3rd Semester

Subject Name: Principles of Anaesthesia (Theory+ Practical)
Course Code: OTT242M301/ OTT242M311
Course Type: Major
Course Level: 200
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	**10 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	**10 hours**
III.	**Monitors and Gas Analyzers:** • Pulse oxymeter / Plethysmograph • EtCO2 Monitor / Capnograph • NIBP, IBP, Temperature, ECG • FiO2 • Transcutaneous oxygen monitor • Inhalational agentsanalyser, BIS, Nerve stimulator • Resuscitation Techniques in OT	**12 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	**12 hours**
TOTAL		**44hours**

Principles of AnaesthesiaPractical
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	**7.5 hours**
II.	• Semi – Closed, closed circuits. • Cleaning and Maintenance of Anaesthesia Equipments	**7.5 hours**
III.	• Capnography, Plathysmography, Gas Analysers • Maintenance of Airway, CPR Technique, Defibrillation, AMBU Bag	**7.5 hours**
IV.	• Oropharyngeal and nasopharyngeal airways, face masks-types and sizes • Pre anaesthesia checklist	**7.5 hours**
TOTAL		**30 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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: Basics of OT and Surgical Procedures (Theory & Practical)
Course type: Major
Course Code: OTT242M302/ OTT242M312
Course Level: 200

L-T-P-C – 2-0-2-4 **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.	**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.	**10 hours**

	Layout of the OT **Anesthesia Service:** History, pre-operative, Intra operative &post operative care. **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.	
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. •	**14 hours**
III.	**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.	**10 hours**
IV.	• 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.	**10 hours**
TOTAL		**44hours**

Basics of OT and Surgical ProceduresPractical
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Operation Theatre sterilization- Different recent advances.	**5hrs**

II.	• Preparation of the patient, patient positioning, post operative observation.	**7.5hrs**
III.	• Electrocautery- Preparation, working mechanism and usage.	**7.5hrs**
IV.	• Cardiac monitors, blood pressure and ECG monitoring. • Respiratory monitors, respiratory rate, Spirometers, SpO2, and EtCO2. • Temperature monitors. • Principles and techniques of temperature monitoring.	**10hrs**
TOTAL		**30 hrs**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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: Techniques of Anesthesia (THEORY)
Course type: MINOR
Course Code: OTT242N301
Course Level:200

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

Objective: The learning objectives are designed to provide a thorough grasp of the significance of preoperative assessment and patient preparation in assessing Anaesthesia risks and planning appropriate care. The design, components, and performance of the anaesthesia machine, safety systems, fluid management strategies, emergency drugs, anaesthetic induction and airway management procedures, and airway devices are all covered in this course. It also discusses the principles of balanced anaesthesia, the administration of inhalation and intravenous anaesthetics, vital sign monitoring techniques, depth of anaesthesia, and oxygenation.

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 hear.	**BT 2**
CO3	**Identify** any underlying conditions that can abrupt the surgery.	**BT 3**
CO4	**Examine** the different equipments before aanesthesia administration and surgery.	**BT 4**

Detailed Syllabus

Modules	**Topics (if applicable) & Course Contents**	**Periods**
I.	• Preoperative assessment and patient preparation: Understanding the importance of preoperative evaluations, patient history, and physical examinations to assess Anaesthesia risks and plan appropriate care. • Perioperative Fluid Management: Strategies and Considerations. (Crystalloids and Colloids). • Perioperative Emergency Medications: Indications, Administration, and Management.	**16 hours**
II.	• Anaesthesia Machine: Design, Components, and Functionality. • Safety systems in Anaesthesia machine. Flow systems, CO2 Absorbents, Circuit types, Humidification devices.	**18 hours**
III.	• Anaesthetic induction and airway management: Learning about various induction techniques, airway devices, and strategies for maintaining a patent airway during surgery.	**14 hours**

IV.	• Maintenance of Anaesthesia and monitoring: Understanding the principles of balanced Anaesthesia, administration of inhalation and intravenous anaesthetics, and monitoring techniques for vital signs, depth of Anaesthesia, and oxygenation	**12 hours**
TOTAL		**60 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
90 NCH	-	30NCH (Hospital visit, Home assignments, project, seminar)

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

Subject Name: Pharmacology
Course type: SEC
Course Code: OTT242S101
Course Level: 200

L-T-P-C – 2-1-0-3 **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.	**6 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.	**6 hours**
III.	**Neuropharmacology:** • Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines, Antianxiety Drugs: Benzodiazepines, Other Anxiolytics,	**6 hours**

	Antiepileptic drugs, Narcotic analgesics.	
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		**60 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60 hours	-	30 hours (Hospital visit, Home assignments, project, seminar)

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.

4th Semester

Subject Name: Airway Management and Respiratory Emergencies (Theory+ Practical)
Course type: Major
Course Code: OTT242M401/ OTT242M411
Course Level: 200

L-T-P-C – 3-0-2-4 **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	**11 hours**
II.	**Advanced airway management** • Endo tracheal intubations • Kings LT Airway	**11 hours**

	• Digital intubations • Laryngeal mask airways and Combitube intubations • Rapid sequence intubations.	
III.	**Surgical Airway** • Surgical and non surgical airways. • Special patient consideration.	**11 hours**
IV.	**Respiratory emergencies – I** • Airway problems versus breathing problems. **Respiratory emergencies - II** • Obstructive airway diseases. • Assessment and management of various respiratory problems.	**11 hours**
TOTAL		**44hours**

Airway Management and Respiratory Emergencies Practical
Detailed Syllabus

Modules	Topics (if applicable) & Course Contents	Periods
I.	• Manual Airway Manuevers • Suctioning procedures • Airway Adjuncts	**7.5 hours**
II.	• Supplemental Oxygen Therapy • Supplemental Oxygen delivery devices • Ventilatory support devices.	**7.5 hours**
III.	• Advance airway management: • Endotracheal intubation • Alternative advance airway devices and procedures.	**7.5 hours**
IV.	• Surgical and non surgicalcritothyrotomy • Tracheostomy.	**7.5 hours**
TOTAL		**30 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
44 hours	30 hours	16 hours (Hospital visits, Demonstration, Case study)

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: Microbiology and Pathology (THEORY)
Course type: Major
Course Code: OTT242M402/ OTT242M412
Course Level: 100

L-T-P-C – 3-0-2-4 **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.	• Bacteria: Cell structure, elementary idea about classification and morphological basis. Staining reactions: Gramstaining, spore staining, acid fast staining. Bacterial growth: nutritional requirements, physical factor affecting,culture media, and growth curve. Elementary idea about bactericidal agents: Phenol, alcohol. • Sterilization (principles, types & methods). Pasteurization. Antibiotics: Bacteriostatic and bactericidal effects. • Virus: elementary knowledge of viral-morphology, viral genome and classification, viral replication. Herpesviruses, hepatitis viruses, miscellaneous viruses, human immunodeficiency viruses.	**10 hours**

II.	• Microbial growth & death, Laboratory culture, host pathogen interactions, antimicrobial chemotherapy,pathogenic mechanisms common to external ocular infections process – clinical pathology. • Physiology, pathology, treatment & epidemiology of infectious diseases caused by bacteria, virus, fungi &parasitic organisms in hot climate as in India.	**12 hours**
III.	General Pathology • Structure & function of immune system – Structure and function of thymus, spleen & red bone narrow- Immunity& its types , plasma proteins & immune reaction, cells involved in immune system. Humoral immunity theories ofantibodies formation. • Structure & function of lymph nodes. Structure & function of thymus, spleen & red bone marrow. • Non specific immunity, Antibody mediated immunity, specific immunity, cell modified immunity, Activeimmunity, Passive immunity. • The acute inflammatory reaction – changes in acute inflammation, changes in the calibre of the blood vessels,changes in blood flow, changes associated with exudation.	**12 hours**
IV.	Inflammation & Repair: • Inflammation. Role of the mast cell in inflammation. Role of the platelets in inflammation. Chronic inflammation– cause, classification, general features. • Source of infection. Transmission of organisms to the body. wound infections. Wound healing. • Immuno-pathogenesis – type I, II, III & IV hypersensitivity. Mechanism of autoimmunity. Organ specific & nonorgan specific auto immune disease. The HLA system – histocompatibility complex. Pyogenic & bacterialinfection. • Disorder of growth – metaplasia, dysplasia, neoplasia. Circulatory disturbances – thrombosis, infarction, ischemia,embolism. Degeneration (calcification).	**10 hours**
TOTAL		**60hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60 hours	-	30 hours (Hospital visits, Demonstration, Case study)

Text Book:

Subject Name: Medicines Relevant to Operation Theatre
Course type: Minor
Course Code: OTT242N401
Course Level: 200

L-T-P-C – 3-0-0-3 **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	**6 hours**
II.	**Hypertension** • Signs and symptoms • Management	**6 hours**

	• Causes • Pathophysiology • Diagnosis –Prevention **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	**6 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	**6 hours**
TOTAL		**60hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60 hours	-	30 hours (Hospital visits, Demonstration, Case study)

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: Cardiovascular Emergencies (T)
Course type: Minor
Course Code: OTT242N401
Course Level: 200

L-T-P-C – 2-1-0-3 **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.	**11 hours**
II.	**Resuscitation** from Circulatory Shock, Mechanical Support in Cardiogenic Shock, Resuscitation of Hypovolemic Shock, Epistaxis.	**11 hours**
III.	**ECG & arrhythmias: 12 lead ECG's:** Different waves of ECG, Depolarization & Repolarization, different heart rhythm, ECG reading.	**11 hours**
IV.	**Basic & advanced cardiac life support:** Cardiopulmonary resuscitation, Low Systemic Arterial Blood Pressure, Tachycardia & Bradycardia,	**11 hours**

	Supraventricular Arrhythmias, Ventricular Arrhythmias, Conduction Disturbances & cardiac Pacemakers, Sudden cardiac Death, Implantable Defibrillators. **Debrillation**: • Manual Defibrillation • Automated External Defibrillator.	
TOTAL		**60 hours**

Credit Distribution		
Theory/ Tutorial	**Practicum**	**Experiential Learning**
60	-	30 hours (Hospital visits, Demonstration, Case study)

Text Book:

5. 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.
6. Surgical Instrumentation, Renee Nemitz.
7. Operation theatre techniques and Management, MP Sharma, AITB