BSc. Anesthesia and Operation Theatre Technology

2024 – 2025

INTRODUCTION

A Bachelor of Science (BSc) in Anesthesia and Operation Theatre is a specialized undergraduate program designed to prepare individuals for roles in the management of operation theatres, as well as for assisting in the administration of anesthesia during surgical procedures. This course integrates theoretical knowledge with practical skills, emphasizing the safe and effective delivery of anesthesia and the efficient functioning of operation theatres.

Graduates with a BSc in Anesthesia and Operation Theatre Technology (AOTT) have a wide range of career opportunities within the healthcare sector. The scope of employment for these professionals is diverse and often involves working in collaboration with medical teams to ensure the smooth functioning of operation theatres and the safe administration of anesthesia.

BASKET - 1				
School Core Courses				
Sl.No.	**Subject Code**	**Subject**	**Subject Type** (T - P- Pj)	**Credits**
SC-1	CUTM 2603	General Anatomy	3 2 0	5
SC-2	CUTM 1758	General Physiology	3 2 0	5
SC-3	CUTM 2604	Basic Biochemistry	3 2 0	5
SC-4	CUTM 1760 / 2605 / 1761	Biology / Cell Biology / Mathematics	3 0 1	4
		Total Credits		**19**

Programme Objectives

PO1: Foundational Knowledge: Provide students with a comprehensive understanding of human anatomy, physiology, pharmacology, and related medical sciences.

PO2: aesthesia Techniques: Equip students with the theoretical and practical knowledge required to administer different types of anaesthesia, including general anaesthesia, regional anaesthesia, and local anaesthesia.

PO3: Operation Theatre Management: Teach students the principles of operation theatre management, including aseptic techniques, sterilization procedures, and the organization of surgical procedures.

PO4: Medical Equipment Proficiency: Familiarize students with the operation, maintenance, and troubleshooting of anaesthesia machines, monitoring devices, and other medical equipment used in operation theatres.

PO5: Patient Assessment: Train students in pre-operative patient assessment, including evaluating medical history, conducting physical examinations, and assessing the patient's suitability for anesthesia.

PO6: Intra-operative Monitoring: Develop skills in monitoring patients during surgery, including vital signs, anaesthesia depth, and responding to changes in patient status.

PO7: Post-operative Care: Instruct students on post-operative care, including pain management, monitoring for complications, and ensuring patient comfort and safety.

PO8: Communication Skills: Enhance communication skills to effectively interact with patients, their families, and healthcare professionals in a clear and empathetic manner.

PO9: Emergency Response: Prepare students to handle emergency situations in the operation theatre, such as cardiac arrest or anaphylaxis, through simulation exercises and training.

PO10: Ethical and Legal Standards: In still an understanding of ethical principles and legal considerations in healthcare practice, including patient confidentiality, consent, and professional conduct.

PO11: Professionalism and Collaboration: Foster a commitment to professionalism, teamwork, and collaboration with other members of the healthcare team, including surgeons, nurses, and other allied health professionals.

PO12: Continuous Learning: Encourage a mindset of lifelong learning and staying updated on advancements in the field through continuing education and professional development.

PEO No.	Program Educational Objectives (PEOs)
PEO 1: Professional Competence	Graduates will apply strong foundational knowledge in anatomy, physiology, pharmacology, and anaesthesia sciences to perform effectively in anaesthesia and operation theatre settings.

PEO 2: Clinical and Technical Expertise	Graduates will demonstrate proficiency in anaesthesia techniques, operation theatre management, patient monitoring, and handling of anaesthesia equipment in clinical environments.
PEO 3: Patient Care and Safety	Graduates will contribute to safe and effective patient care by performing pre-operative assessment, intra-operative monitoring, and post-operative care while responding appropriately to emergency situations.
PEO 4: Professionalism and Ethical Practice	Graduates will practice with high ethical standards, professional responsibility, effective communication, and collaborative teamwork within multidisciplinary healthcare settings.
PEO 5: Lifelong Learning and Career Development	Graduates will pursue continuous learning, professional development, and advanced training to keep pace with evolving medical technologies and healthcare practices.

Subject Code	Name of the Subject	T - Pr- Pj	Credits
CUTM 2603	**General Anatomy**	**3 2 0**	**5**

Course Objectives:

- To obtain Knowledge about the general anatomy – the structure of different organs and position of the organ.
- To familiarize the student with the different anatomical terminology and positions of the body.
- To develop the students to identify the structural reinforcement of the anatomical structures of human body, which would help the student to develop 3D images of the organs

Learning Outcomes:

- Can acquire knowledge about the general anatomy – the structure of different organs and position of the organ.
- The student gets familiarized with the different anatomical terminology and positions of the body.
- One can technically identify the structural reinforcement of the anatomical structures of the human body, which would help the student to develop 3D images of the organs.

Module -1 INTRODUCTION TO ANATOMY AND SKELETON

Sub division of anatomy, terms and terminology, body cavities and membranes, directional terms, abdominal regions, types of body movements systems of the Body. Classification of bones & anatomy of long bones.

Module –2 RESPIRATORY & DIGESTIVE SYSTEM

Respiratory system: Anatomy of nose, pharynx, trachea, bronchi, lungs, broncho-pulmonary segments, ribcage & intercostals muscles

Digestive system: Anatomy of mouth, pharynx, oesophagus, stomach, small intestine, large intestine, rectum, anus. Anatomy of liver, gall bladder & pancreas

Module -3 CARDIOVASCULAR SYSTEM & LYMPHATIC SYSTEM

Anatomy of heart, systemic circulation, anatomy of artery, vein & capillary, major blood vessels of the body.
Anatomy of lymphatic system – lymphatic vessels, lymphatic nodes, spleen, thymus, tonsils, payer's patches

Module -4 EXCRETORY & INTEGUMENTARY SYSTEM

Anatomy of kidneys, ureters, urinary bladder, urethra
Anatomy of skin, nails & hair

Module -5 MUSCULAR SYSTEM

Structure of muscle fibre, head and neck muscles (frontalis, orbicularis oculi, orbicularis oris, buccinators,

zygomaticus, chewing muscles, platysma, sternocleidomastoid), trunk muscles (pectoralis major, intercostals muscles, muscles of the abdominal girdle, trapezius, latissimus dorsi, erector spinae, quadratus lumborum, deltoid), muscles of upper & lower limb (major muscles)

Module -6 NERVOUS SYSTEM & SPECIAL SENSE ORGANS

Nervous system: classification and parts of nervous system, anatomy of brain, spinal cord, meninges, structure of neuron, spinal nerves, cranial nerves & nerve plexus

Special sense organs: Structure and function of Visual system, auditory system, gustatory system, olfactory system.

Module -7 SKELETAL SYSTEM & NECK ANATOMY

Structure of long bone, Development Of Bone, Classification Of Bones. Classification of joints with examples

Anatomy of neck & neck triangles, muscles of mastication, temparo-mandibular joint

Module -8 (Only for optometry)

OCULAR ANATOMY: orbit and its contents, ocular muscles- origin, insertion. Action and its nerve supply, movements.

Only for radiographers:

Surface anatomy of all systems

PRACTICE

1. Identification and description of all anatomical structures.
2. The learning of Anatomy is by demonstration only through dissected parts, slides, models, charts, etc.
3. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).
4. Demonstration of skeleton- articulated and disarticulated.
5. During the training more emphasis will be given on the study of bones, muscles, joints, nerve supply of the limbs and arteries of limbs.

6. Surface anatomy: Surface landmark-bony, muscular and ligamentous. Surface anatomy of major nerves, arteries of the limbs. Points of palpation of nerves and arteries

Suggested Readings

1. Text book Anatomy & Physiology for nurses by Evelyn Pearce, Publisher Faber& Faber.
2. Text book Anatomy and Physiology for nurses by Sears, Publisher Edward Arnold.
3. Anatomy & Physiology- by Ross and Wilson, Publisher Elsevier.

Reference Books

1. Anatomy & Physiology: Understanding the human body by Clark, Publisher Jones & Bartlett.

2. Anatomy and Physiology for nurses by Pearson, Publisher Marieb & Hoehn.
3. Anatomy and Physiology by N Murgesh, Publisher satya.

Subject Code	Name of the Subject	T - Pr- Pj	Credits
CUTM1758	**General Physiology**	3 2 0	**5**

Course Objectives:

- To obtain Knowledge about the general physiological systems and physiological terminology.
- To familiarize the student with the functionality of different physiological systems.
- To develop the technical skills in identifying the Biopotential and their recording and advanced systems.

Learning Outcomes:

- Can acquire knowledge about the general physiological systems and physiological terminology.
- The student get familiarized with the functionality of different physiological systems
- One can technically identify the Biopotential signals, their recording and advanced systems.

Module -1

Scope of physiology. Definition of various terms used in physiology.
Structure of cell, function of its components with special reference to mitochondria and microsomes. Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

Module -2

Cardiovascular System: Composition of blood, functions of blood elements.
Blood group and coagulation of blood
Brief information regarding disorders of blood
Heart: myocardium–innervations– transmission of cardiac impulse- Events during cardiac cycle–cardiac output. Structure and functions of various parts of the heart

Module-3

Circulation: General principles, Peripheral circulation: peripheral resistances–arterial blood pressure– measurements–factors, Regulation variations–capillary circulation–venous circulation.
Special circulation: coronary cerebral–miscellaneous, Arterial and venous system with special reference to the names and positions of main arteries and veins. Brief information about cardiovascular disorders.

Module -4

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration. Mechanics of respiration–pulmonary function tests–transport of respiratory gases-neural and chemical regulation of respiration–hypoxia, –asphyxia.

Module-5

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney, structure of nephron– mechanism of urine formation, composition of the urine and abnormal constituents, urinary bladder & micturition. Patho-physiology of renal diseases and edema.

Practice: - Examination of pulse, B.P, Respiratory rate, Heartbeat, impulses etc.
Identification of different arteries and Venous supply from chart or PPT.

Module-6

Digestive System: names of various parts of the digestive system and their functions. structure and functions of liver, physiology of digestion- functions and regulations of Salivary digestion, Gastric pancreatic digestion, Intestinal digestion and absorption.

Lymphatic system: Name and functions of lymph glands, Reticulo endothelial system: Spleen, lymphatic tissue, Thymus

Module-7

Nervous System: Neuron–Conduction of impulse– synapse–receptor. Sensory organization–pathways and perception, Reflexes–cerebral cortex– functions. Thalamus–Basal ganglia Cerebellum, hypothalamus. Autonomic nervous system– motor control of movements.

Reproductive system. Structure and function of Male reproductive system–control & regulation, Female reproductive system– uterus–ovaries–menstrual cycle–regulation–pregnancy & delivery–breast–family planning

PRACTICE

1. Identification of different organs and systems from charts
2. Identification of different blood cells, their normal and abnormal morphology from slides.
3. Examination of pulse, B.P., Respiratory rate.
4. Reflexes
5. Spirometry to measure various lung capacities & volumes, Respiratory rate, Tidal volume, IRV, IC,
6. ERV, EC, residual volume on Spirometry.
7. Estimate of Hemoglobin, R.B.C., W.B.C., TLC, DLC, ESR count.
8. Blood indices, Blood grouping, Bleeding & Clotting time

Text books

1. Text book Anatomy & Physiology for nurses by Evelyn Pearce, Publisher Faber& Faber.
2. Textbook Anatomy and Physiology for nurses by Sears, Publisher Edward Arnold.
3. Anatomy & Physiology- by Ross and Wilson, Publisher Elsevier.

Reference Books

1. Anatomy & Physiology: Understanding the human body by Clark, Publisher Jones & Bartlett.
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Subject Code	Name of the Subject	T - Pr- Pj	Credits
CUTM2604	**Basic Biochemistry**	3 2 0	**5**

Course Objectives:

- Biochemistry is the study of biological phenomena at the molecular level.
- Its aim is to understand the fundamental chemical principles that govern complex biological systems.
- The program is an interdepartmental major between biology and chemistry that emphasizes the importance of a solid foundation in the natural sciences.
- The major focuses, however, on disciplines within biology and chemistry, ranging from cell biology and molecular biology to analytical chemistry and physical chemistry.

Learning Outcomes:

- Biochemistry helps in clinical diagnosis, understanding pathology of diseases, treatment of diseases, designing of drugs and understanding their metabolism and manufacture of various biological products like amino acids, proteins, antibiotics, hormones, enzymes, nutrients, etc.
- It is expected that the students become conversant with the Fundamentals of Biochemistry which can be applied in clinical diagnosis of the metabolic disorders

Module-1

Enzymes - Introduction, definition, structure of enzyme, classification, coenzymes, isoenzymes, importance of enzyme inhibition

Module-2

Chemistry of carbohydrates - Introduction, definition, classification, biomedical importance & properties
Brief outline of metabolism and significance of Glycogenesis, glycogenolysis, Gluconeogenesis, Glycolysis, citric acid cycle, HMP shunt

Module-3

Amino acids - Definition, classification, essential & non-essential amino acids
Chemistry of Proteins - Introduction, definition, classification, biomedical importance

Module-4

Ammonia formation & transport, Urea cycle, metabolic disorders in urea cycle
Importance substances derived from Phenylalanine, Tyrosine & Tryptophan, glycine

Module-5

Chemistry of Lipids & their related metabolism - Introduction, definition, classification, biomedical importance, brief description about essential fatty acids
Fatty liver, Ketosis, Cholesterol & it's clinical significance, Lipoproteins and their importance

Module-6

Blood glucose levels, HbA1C, glucose tolerance test, glycosuria,
Hyperglycemia & Hypoglycemia & their causes

Module-7

Diagnostic value and importance of Cardiac markers, LFT, RFT, Pancreatic markers, serum electrolytes, lipid profile, serum markers

Biochemistry practical

Quantitative exercises:

- Detection of abnormal constituents in urine, sugar, proteins, ketones, blood and bile salts Bens Jones protein.
- Phlebotomy equipment
- Identification of Blood Collection Tubes & Centrifugal Separation of Blood Plasma and Serum Techniques:
- Colorimeter, blood chemistry analyzer.
- Estimation of blood cholesterol
- Estimation of alkaline Phosphate
- Salivary amylase test (effect of PH and Temperature)
- Estimation of Serum creatinine
- Estimation of Serum uric Acid
- Estimation of total proteins

Text boks

1. Text book of Medical Laboratory Technology, P.B. Godkar 2nd Edn. 2003 Bhalani Publication.
2. Text book of Biochemistry, M. A. Siddique 8th Edn.1993 Vijay Bhagat Scientific Book Co., Patna.
3. Medical Biochemistry by AC Dey.
4. Handbook of Christen Medical Association, India Medical Laboratory Technology- Robert H. Carman.

Subject Code	Name of the Subject	T - Pr- Pj	Credits
CUTM2605	**Cell Biology**	3 0 1	**4**

Course Objectives

To make the student understand all type of cells and cellular components, and how cell works in healthy and diseased states

Learning Outcomes

Students will understand:

- The structures and purposes of basic components of prokaryotic and eukaryotic cells.
- How the cellular components are organized and perform specific functions.
- The cellular components underlying mitotic and meiotic cell division.
- The cellular abnormalities and variations

Course Syllabus

Module- 1 (11 Hrs)

Overview of Cells; Cell theory; Prokaryotic and Eukaryotic cells; Virus; Viroids; Mycoplasma; Prions.

Module- 2 (10 Hrs)

Plasma Membrane: Various models of plasma membrane structure; Transport across membranes: Active and Passive transport, Facilitated Transport; Cell junctions: Tight junctions, Gap junctions, Desmosomes, Hemi desmosomes.

Module- 3 (6 Hrs)

Endomembrane System: Structure and Functions of Endoplasmic Reticulum, Golgi apparatus, Lysosomes.

Module- 4 (8 Hrs)

Mitochondria: Structure and function, Semi-autonomous nature, Endosymbiotic hypothesis, Chemiosmotic hypothesis, Mitochondrial electron transport chain; Peroxisomes: structure and function.

Module- 5 (10 Hrs)

Cytoskeleton: Structure and Functions: Microtubules, Microfilaments and Intermediate filaments; Nucleus: Structure of Nucleus: Nuclear envelope, nuclear pore complex, Nucleolus, Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome).

Module 6

Cell Division and Cell cycle: Mitosis, Meiosis; Regulation of cell cycle.

Module- 7 (10 Hrs)

Cell Signalling: Overview of cell signalling, signalling molecules and receptors, GPCR, Second messengers, Role of second messenger (cAMP) in cell signalling, Activation of gene transcription by GPCR.

Text Books:

1. *Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. VI John Wiley and Sons. Inc.*
2. *De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins*

Reference Books:

1. *Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. V ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.*
2. *Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). The World of the Cell. VII Edition. Pearson Benjamin Cummings Publishing, San*
3. *Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). Molecular Biology of the Cell, V Edition, Garland publishing Inc., New York and London*

BACHELOR OF SCIENCE IN
ANESTHESIA AND OT TECHNOLOGY
Course structure

BASKET - 2
Discipline Core Courses

Sl.No.	Subject Code	Subject	Subject Type (T - P- Pj)	Credits
DC-2	CUTM1811	Introduction to Microbiology	3 0 1	4
DC-3	CUTM1812	Pathology	3 0 1	4
DC-4	CUTM1818	Basic Principles of Hospital Management	3 0 1	4
DC-5	CUTM1814	Basics in Medical Physics & Electronics	3 0 1	4
DC-6	CUTM1815	Basics of Nursing	3 2 0	5
DC-7	CUTM1816	Introduction to anesthesia and OT Technology	3 0 1	4
DC-8	CUTM2606	OT Instruments and Techniques	3 1 0	4
DC-9	CUTM2679	Pharmacology	3 0 1	4
DC-10	CUTM1819	Clinical Practices in Hospital – 1	0 4 2	6
DC-11	CUTM1820	Pharmacology Related to Anesthesia Technology	3 0 1	4
DC-12	CUTM1821	Concepts of Diseases and Techniques in Regional & General Anesthesia Including Complications medical	3 0 1	4
DC-13	CUTM1822	Anesthesia Techniques Including Complication	3 0 1	4
DC-14	CUTM1823	Clinical Practices in Hospital – 2	0 4 2	6
DC-15	CUTM1824	Anesthesia for Specialty Surgeries	3 0 1	4
DC-16	CUTM1825	Anesthesia for Patients with Medical disorders	3 0 1	4
DC-17	CUTM18734	Medical Law Ethics	3 0 0	3
DC-18	CUTM1826	Clinical practices in hospital – 3	0 4 2	6
DC-19	CUTM1827	Anesthesia for specialties(Including Critical Care Assistance and Ventilation) **Paper – II**	3 0 1	4
DC-20	CUTM1828	Post Anesthesia care Unit	3 0 1	4
DC-21	CUTM1829	Health Care Management	3 0 1	4

DC-22	CUTM1830	Clinical Practices in Hospital – 4	0 4 2	6
DC-23	CUTM1831	Internship & Project	Comprehensive viva	20
DC-24	CUTM1832	Internship & Project	Comprehensive viva	20
		Total Credits		**132**

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
1	CUTM1811	Introduction to Microbiology	3 0 1	4

Course Objectives:

- The content of the rigorous course includes many etiological agents responsible for global infectious diseases.
- It covers all biology of bacteria, viruses and other pathogens related with infectious diseases in humans.
- The course will provide the conceptual basis for understanding pathogenic microorganisms and particularly address the fundamental mechanisms of their pathogenicity.

Learning Outcomes:

- Students are expected to demonstrate proficiency in these areas in order to satisfactorily complete the course.
- They will be able to identify common infectious agents and the diseases that they cause.
- Recognizing and diagnosing common infectious diseases from the clinical presentation and associated microbiology is made easy for further study.

Module I: Introduction

History of microbiology, Classification, shape and arrangements of micro organisms, special characteristics, spores, capsules, enzymes, motility and reproduction.

Module II: Immunology

Infection: Sources of infection, portals of entry and spread of infection. Non specific immunity, Immunity – natural and acquired Immunity, Immunization schedule, applications of antigen antibody reactions, Hypersensitivity

Module III: Growth & nutrition:

Growth & nutrition, Culture Media & Methods, Sterilization & Disinfection, Fundamental aspects of antibacterial agents and antimicrobial susceptibility testing. PRACTICAL EXERCISES**:** Demonstration of Sterilization Methods, Spotters, Gram staining.

Module IV: Bacteriology:

Intriduction to Bacteriology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria Staphyloccci, Streptococci, Pneumococci, Gonococci, Menigococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Klebsiella,

Module V: Virology

Introduction to virology, viral hepatitis, poliomyelitis, Rabies, HIV, FLU(Influenza), Dengue, Chikungunya.

Module VI: Mycology & Parasitology

Introduction to mycology, pathogenic yeasts & fungi, Introduction to parasitology, Amoebiasis, Malaria, Helminthic infections.

Module VII: Applied Microbiology

Outline of common bacterial diseases, treatment & prevention-Respiratory tract infections (upper & lower), Meningitis (septic & aseptic), Enteric infections (food poisoning & gastro enteritis), Anaerobic infections, Skin & soft tissue infections, Urinary tract infections, Sexually transmitted diseases, Tuberculosis & Leprosy, Hospital acquired infections, Biomedical waste management.

PRACTICAL EXERCISES:. Demonstration of Sterilization Methods, Spotters, staining.

REFERENCE BOOKS

1. *Textbook of Microbiology by Ananthanarayan & Panicker's, 8th edition-Universities Press (India) PVT LTD.*
2. *Textbook of Microbiology by C. P. Baveja, 4th edition, Arya Publications.*
3. *Textbook of Medical Parasitology, CK Jayaram Paniker, 5th edition, Jaypee Publications.*
4. *Medical Parasitology by C. P. Baveja & V. Baveja, 2nd edition, Arya5. Publications.*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
2	CUTM1812	Pathology	3 0 1	4

Course Objectives:

- The goal of the Pathology Course is to provide students with essential medical knowledge and a broad understanding of human disease.
- The Course emphasizes & quote; the language of disease & quote; as a necessary foundation for self-education and lifelong learning.
- It describes our current understanding of the pathogenesis and epidemiology of the common or important diseases discussed in lecture.

Learning Outcomes:

- Pathology has a central role to assist students in understanding the mechanisms of disease that lead to the signs and symptoms that must be recognized in patients, forming a differential diagnosis, and applying individual diagnoses and make appropriate diagnostic and treatment decisions..

Module I: General Pathology:

Introduction to Pathology, Concept of Diseases, Classification of Lesions, Bacterial, viral and parasitic.

Module II: Cellular Pathology:

Acute and Chronic Inflammation, Causes Of Cell Injury, Mechanisms Of Cell Injury, Necrosis, Apoptosis, Tissue Renewal Regeneration and Repair, Degeneration, Adaptations Of Cellular Growth And Differentiation, Healing By Repair, Scar formation And Fibrosis, Cutaneous Wound Healing, Healing By First Intention, Healing By Second Intention.

Module III: General Pathological Disorders:

Neoplasia, gangrene, Haemorrhage, shock, embolism and thrombosis. Tuberculosis, Leprosy and Typhoid and Deficiency diseases, Diseases of Infancy and Childhood, Tumors – Terminologies, Nomenclature. Differences between benign and malignant tumors, Tumors – Etiology, Pathogenesis and Spread of Tumors.

Module IV: Haematological & Cardiovascular Disorders:

Arteriosclerosis, Atherosclerosis, Hypertensive Vascular Disease, Ischemic Heart Disease,Hypertensive Heart Disease, Valvular Heart Disease, Infective Endocarditic, Rheumatic Fever And Rheumatic Heart Disease, Cardiomyopathies, Leucopenia, Anemia's, Polycythemia, Bleeding Disorders, Reactive roliferations Of White Cells.

Module V: The Lung, The Gastrointestinal Tract, Liver And Biliary Tract:

Acute Respiratory Distress Syndrome, Obstructive Pulmonary Diseases, Pulmonary Infections, Gastritis, Peptic Ulcer Disease, Inflammatory Bowel Diseases, Liver Function Tests, Hepatic Failure, Cirrhosis, Portal Hypertension, Jaundice, Cholelithiasis

Module VI: The Urogenital System & the Endocrine System,

Renal Function Tests, Nephrotic Syndrome, Nephritic Syndrome, Urolithiasis, Pap Smear, Thyroid Gland – Hyperthyroidism, Hypothyroidism, Thyroiditis, Graves Disease, Diffuse And Multinodular Goitres, Parathyroid Glands – Hyperparathyroidism, Hyperparathyroidism, Type I and II Diabetes.

Module VII: Bones AND Joints and Nervous System:

Fractures, Osteomyelitis, Arthritis, Osteoarthritis, Rheumatoid Arthritis, Infectious Arthritis, Diseases of Peripheral Nerve, Diseases of Skeletal Muscle, Infections of CNS – CSF Findings.

REFERENCE BOOKS

1. *Pocket companion to Pathologic Basis of Disease by Robbins and Cotran, 7th edition, Saunders.*
2. *Pathology Quick Review and MCQs by Harsh Mohan, 2nd edition, Jaypee Publications*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
3	**CUTM1818**	**Basic Principles of Hospital Management**	3 0 1	**4**

Course Objects:

- To impart knowledge about the Principles of Hospital Management and Organization
- To familiarize the student with the importance and different functions of Management.
- To learn about the concepts of inventory control and get awareness regarding the National Programmes of Health and disease eradication/control.

Learning Outcomes:

- The student acquires knowledge about the Principles of Hospital Management and Organization.
- The student understands the importance and different functions of the Management.
- The student gets familiarize thoroughly with the concepts of inventory control and gets awareness regarding the National Programmes of Health and disease eradication/control**.**

Module I: Introduction to management & Organization:
The evolution of Management, Definition and importance of Management. Planning – Organizing – staffing – Motivating – Leading – Controlling. Management of health care units (in brief).

Module II: Individual behaviour in organization; organizational functioning (Group/Individual); Perception; Motivation MBO; Organizational Development.

Module III: Planning and Management of Hospitals & Clinical Services:
Building and physical layout – space required for separate function – Planning of infrastructure facilities, clinical services, equipment & Human resources – Types of Hospitals.

Module IV: Organization and administration of various clinical services; outpatient services. In-patient services, emergency services, operation theatres, ICU's and super specialty services.

Module V: Organizing of support clinical services & Hospital management:
Imaging – CSSD – Laboratory – Blood Bank – diet – Medical Records – Mortuary. Housekeeping – Maintenance (Water, Electricity, Civil, air Conditioning, Lift)-Pest Control-transport-Security. Forecasting-Purchasing & procurement (Sourcing, methods and procedures)

Module VI: Storing & issuing, Concept of inventory control, Maintenance of equipment and contracts (with special reference to major biomedical equipment). Trends in financing of Health and Hospital Services – Classification of Hospitals depending on source of financing – roles of financial institutions.

Module VII: National Programmes of Health and disease eradication / control

a. Health Programmes:

i. Family Welfare Programme
ii. National Programme for water supply and sanitation.
iii. Nutritional Programmes.
iv. Immunization and universal immunization programme.

b. Disease Eradication programme: Leprosy & Guinea worm, polimyclitis.

c. Disease control programmes: Tuberculosis, Malaria, Filaria, S.T.D, Goitre, Cholera and other diarrhoeal diseases and National Programme for prevention of blindness including trachoma, vector bone disease.

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
4	CUTM1814	Basics in Medical Physics & Electronics	3 0 1	4

Course Objective:

- To understand the importance of the physical principles in lasers, nuclear physics, electricity and magnetism and radiation physics.
- To study the different types of techniques.
- To develop an understanding of physics and their applications
- To understand how to protect from radiation and nuclear sources.

Learning outcomes:

- Know what are the principles followed in radiation and nuclear physics.
- Understand the need of radioisotopes in medical field.
- Understand about the radioactive substances.
- Understand the application of semiconductors in medical instruments.

Module I: Laser

Nature of light-Reflection-Refraction-Total internal reflection-Optical fibers-Applications in Medicine – Laser-Principles-Action-Types of laser, Basic principles of laser in Medical Application – Argon- Iron laser photo coagulator-Photo Thermal-Photochemical Application-Applications of laser in Medicine-Laser hazards and safety measures.

Module II: Radiation Physics

Introduction to radiation physics, X-ray, production of x- ray, Properties of x-ray radiations – Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement.

Module III: Nuclear Physics Introduction to nuclear physics, Radioactivity: Radioactive radiations, Nature of Nuclear radiations- Properties of Alpha, Beta and Gamma rays, Natural and artificial radioactivity, Half-life period- Nuclear Fission and Fusion- Nuclear reactions. Medical applications of radio isotopes.

Module IV: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope-Radiography: Making and X-ray Image-Fluoroscopy. CT Scans, MRI – Ultrasonography: Ultrasound picture of Body-A-Scan- M-Scan-Ultrasound Diathermy-Phonocardiography – Radio isotopes: Uses of Radio isotopes – 99mTc Generator – Scintillation detectors – Application of scintillation detectors – Gamma Camera – Positron Camera

Module – V: Electricity & Electromagnetism

Electric charge- Conductors and insulators- Coulomb`s law- Electric field-Electric lines of force-

properties of lines of force- Electric field strength-Capacity- Units of capacity- Potential energy of a charged conductor-Principle of a condenser- Capacity of a parallel plate condenser-Electric current and its units- Potential difference-Electromotive Force- Ohm's law – Electric Power and Electric Energy-Kirchhoff`s Law.

Module VI: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers – Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Module VII : **Gas physics:** States of matter, Temperature conversion, Humidity, Pressure measurement, Gas flows and diffusion, Gas laws, Miscellaneous concepts such as density and specific gravity

REFERENCE BOOKS:

1. *New Understanding physics for advanced level – Jim Breithauput.*
2. *Advanced Physics for you by Keith Johnson, Simmons Hewett, Sue holt, John miller*
3. *Christensen's Physics of diagnostic Radiology by Thomas S. Curry III, M.D., Robert C Murry, Jr. PhD, Dow Dey, PhD.*
4. *Applied Electronics, A. Subramanyam, The National Publishing co., Madras (1996).*
5. *Design and Development of Medical Electronic Instrumentation, David Prutchi and Michael Norris, John Wiley & Sons (2005).*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
5	CUTM1815	Basics of Nursing	3 2 0	5

Course objectives:

- To make the students learn about the basic nursing care

Learning outcomes:

- At the end of the course students will be knowledgeable in the following areas:
- Basic nursing care
- Relationship with patient
- Patient Care
- Health care system in our country
- Emergency and first aid care
- Basic protocols to be followed during emergency

Module I: Introduction of Health

Health care system, major health problems of the country, nature of disease pattern, technological advances and national health programmes, health for all by 2000 AD. Role of health care workers in the health care delivery system, impact of illness of the individual family and community.

• Communication Skills

• Relationship with patients, process of communication

Module II: Patient care:

Nursing Processes, Problems solving approach, assessment, diagnosis, planning, implementation and evaluation.

Module III: First Aid and Emergencies

Definition, basic principles, scope and rules, Wounds, haemorrhages, shock, fracture, dislocation and muscle injuries, respiratory emergencies, resuscitation, unconsciousness, Miscellaneous conditions, burns, scalds, foreign bodies in the skin, eyes, ear, nose, throat and stomach. Frost bite, effects of heart cramps, bites and stings. Poisoning, Transporting injured persons.

Module IV: Organization of OT:

a) Technician role and responsibilities b) Safety norms, c)Air exchange and air condition, d) Defibrillation, e) Crash cart and its contents, f)Cardiac pacing.

Module V: Preparation and Assissting for Various Surgical Procedures; as Circulating

* Setting up of operation room and table

* Setting up of trays and trolleys for various surgical procedures
* Part preparation for surgical procedures
* Positioning and draping according the surgical procedures
* Incisions for various surgical procedures
* Minor surgeries-surgical instruments and suturing materials
* Major surgeries-surgical instruments and suturing materials

Module VI: Patient Hygiene and Health

• Care of skin, mouth, eyes, nails, hair
• Menstrual hygiene, clothing, mental health, common health problems of poor personal hygiene.
• Comfort, Rest and Sleep
• Hospital Housekeeping

Module VII: Health Education

Introduction to principles and methods of health education. Use of audio visual aids, mass education, role of nurse in health education.

Basics of Nursing Practice

1. First Aid
2. CPR,
3. Nursing Workshops.
4. Bandaging types
5. Various positions in nursing foundation lab.
6. Ward visit to monitor BMW management.
7. Demonstration of Patient care Procedures:
    a. Positioning of patient, transport of the patient, Dressing and Bandaging, Care of inter costal drain tube, Insertion of naso-gastric tube and feeding
    b. Phlebotomy and obtaining blood samples, Arterial Blood sampling for ABG
    c. Injections: intra muscular, intra venous, sub cutanious, intra dermal
    d. Insertion of intra venous catheter and infusion of medications, blood transfusion
    e. Recording of ECG and monitoring of patient
    f. Oxygen therapy: oxygen canula masks. Aerosol therapy: nebulization, in halers
    g. Suctioning and care of artificial airway
    h. Insertion of urinary bladder catheter
    i. PPE
8. Basic Life Support (BLS)

REFERENCE BOOKS:

1. *First Aid, CPR, Bandaging types.*
2. *Practice of various comfort devices, various positions in nursing foundation lab.*
3. *Health talk, preparation of 3-5 types of A.V. Aids,*
4. *Ward visit to monitor BMW management.*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
6	CUTM1816	Introduction to anesthesia and OT Technology	3 0 1	4

Module I:

- **Introduction To Anesthesia:** History of Anesthesia: Prehistoric (Ether) era, Inhalational anesthetic era, Regional anesthetic era, Intravenous anesthetic era, Modern anesthetic era
- **Oxygen production devices:** liquid oxygen, compressed oxygen, oxygen concentrator
- **PSA devices**
- **Medical Gas Supply:** Compressed gas cylinders, Colour coding, Cylinder valves, Cylinder storage, pin index, Diameter index safety system, Gas piping system, Alarms & safety devices.
- **Gas Administration Devices:** Simple oxygen administration device, Methods of controlling gas flow, Reducing valves, Flow meters, Regulators, Flow restrictors

Module II : Laryngoscope & Bronchoscope Different types of laryngoscope, parts of laryngoscope, bronchoscopy procedure and position of the patient.

Module III: Machine breathing system

- **Anaesthesia Machine:** Hanger and yoke system, Cylinder pressure gauge, Pressure regulator, Flow meter assembly, Vaporizers -types, hazards, maintenance, filling & draining, etc
- General considerations, Classification and breathing system, Mapleson System,

Jackson Rees system of Bain circuit, Non breathing valves – Ambu valves, Others

Module IV: Face Masks & Airway Laryngoscopes

- Endotracheal tubes – Types, sizes, (RAE Tube, Flexo metallic). Complications – Use care and maintenance of anaesthesia equipment 2) Laryngoscopes in Anaesthesia
- **Oxygen Therapy:** Definition, Causes and responses to hypoxemia, Clinical signs of hypoxemia, Goals of oxygen therapy, Evaluation of patients receiving oxygen therapy, Hazards of oxygen therapy.

Module V: Mechanical ventilator

Setting up of ventilator, different modes of ventilator , ventilation and its types.

Module VI: MONITORING

- ECG
- Temperature
- IBP
- CVP
- PA Pressure
- LA Pressure
- Bio Medical engineering of Trouble sorting Management, care of cleaning
- ETCO2
- Urine output

Module VII: CSSD, Instrumentation, store and inventory**,** Anaesthesia Ventilator and Working principles

Recommended Books

1. *Text books: Recent edition*
2. *The Anaesthesia Technician and Technologists Manual by Ahanatha Pillai*
3. *Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition*
4. *Dixon, Elleen-Theatre techniques-5th edition Reference books 1 Nurse Anaesthesia by Nagelhout and Plans-5th edition 2 Clincalanaesthesia by Pramila Bajaj-5th edition 3 Wards textbook of anaesthesia*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
7	CUTM1817	OT Instruments and Techniques	3 1 0	4

Course objectives:

- To make the students learn about the Surgical equipments, their use, han

Learning outcomes:

- At the end of the course students will be knowledgeable in the following areas: different Operation theaters and special surgical equipment used there and cleaning and maintaining of instruments.

Module I. Sterilization

Sterilization - Types Dry Heat ,Moist Heat
Sterilization And Disinfections Used In OT
Methods of checking sterilization markers (biological, chemical)

Module II. Instruments terminology and identification

Laparoscopic instruments, Cheatles Forceps, Sponge Holding Forceps, Esmach's Bandage, Simple Tourniquet, Pneumatic Tourniquet, Common terminologies used
Bard Parker Knife Handle, Major Abdominal Incision, Artery Forceps and their Types, Instruments Used in Homeostasis, Kocher's Forceps, Single Hook Retractors, Czerny's Retractor,
Nerve Hook retractors, Morris Retractors, Deaver's Retractors.

Module III. Patient positioning and Operating theater equipment :

Operation Room, operating table, Electric Cautery, Suction Machine, Nerve stimulator, Bedside Ultrasound Fumigator

Module IV: Patient positioning and related physiology

Positions used for surgeries under anesthesia – physiology and associated complications related to patient positioning on OT table

Module V: Wound management

Wound Types of wound, Scissors And Its Types, Sucking Material and Techniques, Disinfectants And Irritants, Dressing Procedures, Different Types of Bandages, Surgical Needle & Needle Holders
Various Types of Suture Material, Various Types of Drains Using In Surgery

Module VI: Sterilization –types Autoclave, Hot air oven
Ethylene oxide Sterilization, Disinfection and various disinfectants, Fumigation of OR, Lay out of OR

Module VII: Ten golden rules in anesthesia
General anesthesia Protocols, Consent and medico legal aspects, Biomedical waste management
X-ray shooting basic views (AP & Lateral view)

<u>Practical</u>

- Sterilization
- Surgical instruments – various surgeries
- Powered Instruments
- Gloving Technique, Scrubbing Technique
- Various Equipments Used In OT

Recommended Books:

2. *S Ahanatha Pillai- Manual of ANESTHESIA for Operation Theater Technicians.*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
8	CUTM1818	Pharmacology	3 0 1	4

Course objectives:

- To make the students learn about various drugs acting on different body systems

Learning outcomes:

At the end of the course students will be be knowledgeable in the following areas:
Pharmacokinetics and pharmacodynamics of drugs.
Drugs and their actions on different body systems
Detailed study about different anesthetic drugs

Module -I: General Pharmacology Part I

Introduction, Routes of Drug Administration (local and systemic), Pharmacokinetics - membrane transport, absorption, bioavailability, metabolism, plasma half life, excretion and distribution of drugs

Module -II: General Pharmacology Part II

Pharmacodynamics – Mechanisms of drug actions – synergism and antagonism, agonist, antagonist, synergist, Adverse Drug Reactions - drug to drug interaction, drug to food interaction

Module -III: General Pharmacology Part III

Receptor pharmacology - G Protein coupled receptors, Ion channel receptors, Tyrosine kinase - linked receptors, cytokine-receptor family, Receptors with intrinsic enzymatic activity the receptor has intrinsic catalytic activity receptor tyrosine kinases.

Drug Nomenclature and Essential Drugs Concept

Module -IV: Cholinergic System

Cholinergic system – acetyl choline, cholinergic drugs, anticholinesterases, Irreversible Anticholinesterases – classification, mechanism of action, indications, contra indications and adverse effects

Module -V: **Drugs for GIT and Antiemetics**
Antihistamines – Histamine receptors, Classification, mechanism of action, routes of administration, indications, contra indications and adverse effects.
Antacids - Classification, mechanism of action, routes of administration, indications, contra indications and adverse effects.
Antiemetics - Classification, mechanism of action, routes of administration, indications, contra indications

and adverse effects.

Module -VI: Drugs for ANS

Autonomic nerves system – Basic Anatomy & functional organisation of sympathetic and parasympathetic nervous system. List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects

Module VII: Chemotherapy agents and other antibiotics

Chemotherapy – chemoprophylaxis, classification route of administration, indications, contra indications and adverse effects

Antimicrobial agents - spectrum of activity, dose, routes of administration, indications, contra indications and adverse effects of Tetracycline, aminoglycosides, metronidazole, ceftriaxone, azythromycin, pencillin, ketoconazole, flucanozole, amphotericin B

TEXT BOOKS:

1. *Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers.*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
9	CUTM1819	CLINICAL PRACTICES IN HOSPITAL - 1	0 4 2	6

1. Protocols to be followed while entering hospital
    a. Hand Wash
    b. Usage of Hand Rub
    c. Usage of cap, mask, OT dress and Sterile Slippers, Apron, gowns.
    d. Glove technique
2. Case Sheet Proforma & different forms to be filled in the case sheet.
    a. General Proforma
    b. Consent forms.
    c. ICU forms
        i. Blood transfusion form
        ii. MLC form
        iii. PAC form
3. Recording of vitals.
    a. Blood Pressure
    b. SPO_2
    c. Respiratory Rate
    d. Temperature
    e. MAP
    f. Pulse rate
4. Procedures
    a. Venous blood sample
    b. Arterial blood sample
    c. I.V Cannulation.
        i. Site of cannulation
        ii. Finding vein
        iii. Technique of venu puncture

        iv. Urinary catheterization
        v. NG tube insertion
        vi. Oro – gastric tube insertion
5. Basic equipments & instruments
    a. Crash cart
    b. Glucometer
    c. Pulse oximeter
    d. Monitors
    e. Comfort devices
6. Basic Drugs
    a. Paracetmol
    b. IV fluids
    c. Blood & its products
    d. Diclofenac
7. Investigations
    a. CBP
    b. CRP
    c. LFT
    d. CUE
    e. RFT
    f. CBG
8. Antiseptics & Disinfectants
9. BMW Management.

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
10	CUTM1820	Pharmacology Related to Anesthesia Technology	3 0 1	4

Course objectives:

- To make the students learn about various drugs acting on different body systems

Learning outcomes:

- At the end of the course students will be be knowledgeable in the following areas: Pharmacokinetics and pharmacodynamics of drugs
  Drugs and their actions on different body systems

  Detailed study about different anesthetic drugs

Module I: General anaesthetics

Anaesthetic agents – Definition of general and local anaesthetics, types of anesthesia, stages of anesthesia

Classification of general anaesthetics, Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents & Intravenous general anaesthetic agents
Local anaesthetics – Classification, mechanism of action, routes of administration, indications, contra indications and adverse effects

Module II: Opioid Analgesics

Analgesics: Opioid receptors, Definition and classification - Routes of administration, dose, frequency of administration, Side effects and management of non-opioid and opioid analgesics

Module III: Skeletal Muscle Relaxants
Skeletal muscle relaxants – classification, mechanism of action, indications, contra indications and adverse effects
Reversal agents - classification, mechanism of action, indications, contra indications and adverse effects
Adrenergic system – adrenergic receptors, drug classification, mechanism of action, uses, adverse effects

Module -IV: Drugs for ANS

Autonomic nerves system – sympathetic and parasympathetic nervous system. Basic Anatomy & functional organization. List of drugs acting an ANS including dose, route of administration, indications, contra indications and adverse effects.

Module -V: Cholinergic System

Cholinergic system – acetyl choline, cholinergic drugs, anticholinesterases, Irreversible Anticholinesterases. Anticholinergic drugs – classification, mechanism of action, uses, adverse effects

Module -VI: Skeletal Muscle Relaxants

Skeletal muscle relaxants – classification, mechanism of action, uses, adverse effects.

Adrenergic system – adrenergic receptors, drug classification, mechanism of action, uses, adverse effects

Module VII: Other Drugs

Emergency drugs, IV fluids (Nacl, RL, DNS, hemacel, heparin) - various preparations and their usage, Drugs used in metabolic and electrolyte imbalance

Antitubercular drugs – Classification, mechanism of action, routes of administration, indications, contra indications and adverse effects

TEXT BOOKS:

1. *Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers.*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
11	CUTM1821	**Concepts of Diseases and Techniques in Regional & General Anesthesia Including Complications medical**	3 0 1	**4**

Module I: Introduction : First successful clinical demonstration: Balanced anesthesia, Minimum standard of anaesthesia, Who should give anaesthesia?, Ten golden rules of anaesthesia, Assess & prepare, starve, check the drugs and equipment suction, keep the airway clear, be ready to control ventilation have a vein open, monitor pulse & BP, have someone in the room to apply cricoids pressure – if needed.

Module II: Pre-op preparation: Pre anaesthetic assessment, History – HOPI, Past history – disease /surgery / anesth, Personal history – smoking / alcohol, General physical assessment, Systemic

examination – CVS, RS, CNS, PA Local examination.

Module III: Investigations and Pre-anaesthetic orders

1) Routine – Urine, E.C.G, Chest x-ray
2) Patient – Informed consent, NPO
3) Premedication – advantages, drugs used, Special instructions – if any, Machine – Checking the machine, o2, N2O, suction apparatus, Laryngoscopes, ET tubes, airways, Things for IV accessibility, Other monitoring systems
4) Drugs – Emergency drugs, Anaesthetic drugs

Module IV: Intraoperative management and Postoperative complications & management

1) Confirm the identification of the patient, Monitoring – Non-invasive & invasive monitoring, Induction – drugs used, Endotracheal intubation, Maintenance of anesthesia, Positioning of the Patient, Blood / Fluid & electrolyte balance, Reversal from anaesthesia – drugs used, transferring the patient.
2) Recovery room – Set up, Things needed, Problems
3) Complications, Obesity, Anaemia

Module V: Minor sequelae and Major catastrophes

1) Nausea & vomiting, Sore throat, Laryngeal granuloma, Neurological complications, Awareness, Vascular
2) Mortality, Causes of death, Cerebral damage, Prevention

Module VI: ANAESTHETIC consideration in Cardiac Anaesthesia, Cardiac Anaesthesia: * NYHA classification * Arrhythmias -types of arrhythmias and antiarrhythmic drugs * Angina-types * Dyspnoea-causes * Premedication * Setting up of monitoring system * Monitoring - invasive and non - invasive * Getting ready for the case * Induction of cardiac patient, precautions to be taken

Module VII:

Water Electrolyte & Acid Base Disturbances Distribution of Body Water, Dehydration Hyperkalemia, Hypokalemia. Sodium, Calcium Acid Base Disturbances – Types and Treatment. Fluid management in OT, blood loss calculations

Endocrine Disease: Diabetes Mellitus, Thyroid Dysfunction – Thyrotoxicosis, Hypothyroidism Adrenal Gland Dysfunction Diabetes Insipidus.

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
12	CUTM1822	Anesthesia Techniques Including Complication	3 0 1	4

Module I: To setup the required equipments for general anesthesia, spinal, epidural, nerve block.

Module II: Regional anaesthesia technique – Introduction, Indication, Contraindication, Check list, Procedure, Complications, Management, Spinal, Epidural, Nerve Block

Module III: General Anesthesia techniques
General anesthesia techniques – LMA, Intubation, Total intravenous anesthesia, MAC

Module IV: Intra-operative Management
Confirm the identification of the patient. Monitoring – minimum (ISA standards) . Noninvasive & Invasive monitoring. Induction – drugs used. Endotracheal intubation. Maintenance of anaesthesia. Positioning of the patient. Blood/Fluid & electrolyte balance. Reversal from anaesthesia – drugs used. Transferring the patient Recovery room - set up,i. things needed ii. Problems. Post operative complications & management

Module V: Anesthetic consideration in different diseases
Endocrine disease: Pheochromocytoma b) Renal disease: Urolithiasis, TURP

Module VI: Monitoring and procedures done in ICU
Major Catastrophes - Mortality, Causes of death , Cerebral damage, Prevention.
Intensive Care: Central venous access, ECG monitoring, Invasive hemodynamic monitoring

Module VII: General care of patient in ICU-Eye, GI tract, Bladder, skin,
Case of mechanically ventilated patient, Tracheostomy, humidification, Vascular lines – arterial, venous line, Radiography, Physiotherapy – chest physiotherapy

Reference Books: *Davidson's Principles and Practice of Medicine - Elsevier Publications*
Harrison's Principle of Internal Medicine

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
13	CUTM1823	Clinical Practices in Hospital - 2	0 4 2	6

1. Equipments
    i. Infusion pump
    ii. Anesthesia machine
    iii. Suction machine
    iv. Defibrillator
    v. Diathermy
2. Emergency drugs
    i. Oxygen
    ii. Ionotropes
        i. Adrenaline
        ii. Noradrenaline
        iii. Dopamine
        iv. Dobutamine
        v. Isoprenaline
        vi. Vasopressine
        vii. Digoxin
    iii. Sympathomemmetics
        a. Mephenteramine
        b. Phenylnephrine
        c. Ephedrine
    iv. Vasodilators
        a. Sodium Nitroprusside
        b. Nitro-glycerine
        c. Nifedipine
    v. Anticholinergics
        a. Atropine
        b. Glycopyrrolate
    vi. Bronchodilators
        a. Deriphylline
        b. Aminophylline
        c. Salbutamol
    vii. Electrolytes
        a. Sodium Bicarbonate
        b. Calcium Gluconate
        c. Calcium Chloride
        d. Magnesium Sulphate
        e. Potassium Chloride
3. Methods of cleaning and sterilization of anesthetic equipment’s

4. Equipment
    i. Checking the machine
    ii. Laryngoscopes
    iii. Tubes
    iv. Airways
    v. Suction apparatus
    vi. Oxygen Cylinder
5. Positioning and technique for spinal , epidural anaesthesia and general anaesthesia
6. Care of anaesthetized patient
7. Setting of emergency drug tray, intubation tray, IV cannulation tray, LP tray

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
14	CUTM1824	Anesthesia for Specialty Surgeries	3 0 1	4

MODULE -I Neurosurgical Anesthesia
Cerebral Physiology and Pharmacology;
General Considerations in Neurosurgical Patients;
Anesthesia for Conditions with Raised lntracranial Tension;
Anesthesia for Awake Craniotomies (Stereotact ic Surgery);
Anesthetic Management of Spine Surgeries

MODULE -II Anesthesia for Obstetrics & Pediatric Anesthesia
Physiological Changes in Pregnancy, Effect of Anesthet ic Technique/ Drugs on Uteroplacental Circulation
Transfer of Anesthetic Drugs to Fetal Circulation, Anesthesia for Cesarean Section
Labor Analgesia (Painless Labor), Anesthesia for Manual Removal of Placenta
Anesthesia for Non-obstetric Surgeries during Pregnancy
Physiological/Anatomical Changes in Pediatric Population, APGAR score, Anesthetic Management
Regional Anesthesia in Pediatric Patients, Management of Neonatal Surgical Emergencies

MODULE III:
a) Cardiac disease – CAD, Valvular heart disease, congenital heart disease, Hypertension
b) Respiratory disease – COPD, Bronchial Asthma
c) Endocrine disease – DM, Thyroid dysfunction
d) Renal disease – CRF
e) Obesity
f) Cardiopulmonary bypass -indication and its function, I.C.U management, Chest tube management

MODULE IV: Anesthesia for ENT Surgery
Panendoscopy (Previously Called as Microlaryngeal Surgeries), Anesthesia for Bronchoscopy
Anesthesia for Adenotonsillectomy/Tonsillectomy, Anesthesia for Peritonsillar Abscess and Ludwig Angina
Anesthesia for Ear Surgery, Anesthesia for Nasal Surgery, Anesthesia for Parotid Surgery
Anesthesia for Obstructive Sleep Apnea Surgery, Anesthesia forTemporomandibular Joint (TMJ) Surgeries

MODULE V: Anesthesia for Day-care Surgery (Outpatient/Ambulatory Surgery)
Selection of Surgery/ Procedures and Patients, Preoperative Assessment and Premedication
Anesthesia for Day-care Patients, General Anesthesia, Total Intravenous Anesthesia, Regional Anesthesia
Monitored Anesthesia Care, Postoperative Period

MODULEVI: Day care Anaesthesia * Special features * Advantages * Disadvantages * Complication Laparoscopic Surgeries * Complications during laparoscopic procedures * Effects of increased intragasrtic pressure Geriatric Anaesthesia * Physiological changes * Anaesthetic challenges& problems during positioning.

MODULE VII: Trauma Anaesthesia, Thoracic Anaesthesia- Anaesthesia for Trauma &

Hypovolemic Shock * Resuscitation -airway, breathing * Preooperative investigations& assessment * Circulatory management * Causes of unconsciousness * Rapid sequence induction.

* Tension pneumothorax-pathophysiology and management Thoracic Anaesthesia * Pulmonary function tests bed side * Preoperative preparation * Check list * Induction. Intubation Lung isolation- Indications, Techniques, Complications * Double lumen tubes * Monitoring during single lung ventilation * Pain management * Extubation * ICU management

Recommended Books.

1. *1 Paul Marino -The ICU Book -4th edition*
2. *2 Berry, Edna Carnelia & Marie Louis Kohn-Introduction to OR techniques -4th ed.*
3. *3 Brigden, Raymond. J-OT Technical-5th edition*
4. *4 Dixon, Elleen-Theater Techniques-5th edition*
5. *5 Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014)Elsevier*

Reference books *1 Clinical Anaesthesia by Pramila Bajaj-3rd edition*

6. *1 Lee's Synopsis of Anesthesia-13th edition*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
15	**CUTM1825**	**Anesthesia for Patients with Medical disorders**	3 0 1	**4**

Course Objectives

1. To provide knowledge about anaesthetic management of patients with systemic diseases.
2. To understand pre-operative, intra-operative and post-operative considerations in special medical conditions.
3. To develop understanding of complications during anaesthesia in systemic diseases and their management.
4. To prepare students to assist anaesthesiologists in safe perioperative patient care.

Learning Objectives

After completing the course, the student will be able to:

1. Identify common systemic diseases such as hypertension, diabetes, respiratory disorders and cardiac diseases affecting anaesthesia.
2. Explain anaesthetic considerations during pre-operative, intra-operative and post-operative periods.
3. Recognize complications associated with systemic diseases during anaesthesia.

Assist in monitoring, drug preparation and perioperative patient care in special clinical conditions.

MODULE -I Pre OP, Intra OP and Post OP anesthetic management of **-** Hypertension

Hypertension-commonly used antihypertensives - losartan, amlodipine, telmisartan, atenolol, methods to reduce hypertension intraoperatively, complications of intraoperative hypertension.

MODULE II : Pre OP, Intra OP and Post OP anesthetic management of Diabetes Mellitus
Diabetes -insulin preparations, methods to reduce blood sugar levels, complications of uncontrolled diabetes intraoperatively.

MODULE –III: Pre OP, Intra OP and Post OP anesthetic management of respiratory diseases, epilepsy, anaemia- Bronchial asthma/COPD-complications and its management intraoperatively, methods to avoid precipitating bronchospasm
Epilepsy- anaesthesia drugs precipitating an epileptic attack, drugs used for treatment * Anaemia- complications under anaesthesia

MODULE –IV: Pre OP, Intra OP and Post OP anesthetic management of Coronary artery disease-risk factors for having an myocardial/infarction under anaesthesia, drugs used in their management, complications of ischaemic heart disease patient undergoing non cardiac surgery

MODULE V: Pre OP, Intra OP and Post OP anesthetic management of Thyroid disorders-causes of hyper and hypothyroidism, challenges of anaesthetising a thyroid patient, thyroid storm and its management, complications after thyroidectomy

MODULE –VI: Pre OP, Intra OP and Post OP anesthetic management of Obesity,
Obesity-challenges of anaesthetising an obese patient.
Liver Failure Jaundice-intraoperative complications in a liver failure patient

MODULE VII: Pre OP, Intra OP and Post OP anesthetic management of Renal failure - anaesthetic challenges in renal failure patient, intraoperative complications in renal failure patients and its management.,important anaesthetic challenges during renal transplant

Recommended Books:

1. *Berry, Edna Carnelia & Marie Louis Kohn - Introduction to OR Techniques -4th edition*
2. *Brigden, Raymond.J - OT Technical-5th edition*
3. *Dixon, Elleen - Theater Techniques-5th edition*
4. *Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014)Elsevier*
5. *Clinical Anaesthesia by Pramila Bajaj-3rd edition " Stoeltings Anaesthesia for Concurrent illness*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
16	**CUTM1734**	**Medical Law Ethics**	3 0 0	**3**

Module I: General Considerations of Medical Ethics
1. Medical Ethics - Introduction
2. Three Core Contents in Medical Ethics - Best Interest, Autonomy Unrights
3. Doctors, Patient & Profession

Module II :Special Considerations of Medical Ethics
Consent, Confidentiality, Genetics, Reproductive Medicine, Mental Health, End of life and Organ Transportation, Research & Clinical Trials

Module III :content and process for Value Education. Self-Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration. Continuous Happiness and Prosperity- A look at basic Human Aspirations.

Module IV: Understanding Harmony in Nature and Existence - Whole existence as Co-existence Understanding the harmony in the Nature Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature.

Module V: Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

Module VI: Understanding Harmony in the Human Being - Harmony in Myself! Understanding Harmony in the Family and Society-

Module VII: Harmony in Human-Human Relationship . Implications of the above Holistic Understanding of Harmony on Professional Ethics

Recommended Books *Recent Editions.*

1. *Medical Ethics & Law, The Cor Curriculum*
2. *Author - Tony Hope Atla*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
17	CUTM1826	Clinical Practices in Hospital - 3	0 4 2	6

i. Maintaining registers
ii. Narcotic register
iii. Anesthesia notes
iv. MLC register

v. Death register
vi. Usage of peripheral nerve stimulator and ultrasound
vii. Procedure of all the above mentioned blocks,
viii. Asepsis
ix. Types of spinal needles
x. Touhy epidural needle
xi. Epidural set-contents(epidural catheter)
xii. Setting trolley for retrograde intubation
xiii. Setting of airway management equipment trolley for infants and children
xiv. Intraoperative anaesthetic management and monitoring
xv. Drugs used in regional anaesthesia + adjuvants (Morphine, Pethidine, Fentanyl, Sufentanil, Clonidine)
xvi. Atropine, ephedrine, mephentermine, Lipid emulsion
xvii. Difficult intubation cart, difficult airway management, setting up of IBP/CVP

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
18	CUTM1827	Anesthesia for specialties (Including Critical Care Assistance and Ventilation) Paper – II	3 0 1	4

MODULE I: Cardiac anesthesia –
NYHA classification, Arrhythmias, Angina, Dyspnoea, Premedication, Setting up of monitoring system, Monitoring – invasive and non-invasive,
Getting ready for the case, Induction of cardiac patient, precautions to be taken, Transferring the patient to ICU, Care to be taken, ICU management

MODULE II: Neuro Anaesthesia
Glasgow coma scale, Signs of raised ICT, Premedication, Check list, Induction of a patient Positioning in neuro surgery, I.C.P. monitoring, Air embolism, Transferring to I.C.U.Ward

MODULE III: Anaesthesia for Trauma & Shock
Resusciation, Preopinvestigation/assessment, Circulatory management, Management of anaesthesia, Rapid sequence induction, Other problems

MODULE IV:Obstetric Anaesthesia
Differences between a pregnant and a normal lady, Risks for anaesthesia, Precautions to be taken Check list, regional vs general anaesthesia, Induction / maintenance. Resuscitation of the new born, APGAR score, Reversal and extubation, Emergencies – Manual removal of placenta, A.P.H,- P.P.H., Ruptured uterus, Ectopic pregnancy, Labour, Epidural analgesia,

MODULE V: Pediatric Anaesthesia
Theatre setting, Check list, Premedication, Induction, Intubations-securing the ETT, Monitoring, Reversal & extubation – problems, Transferring / IC management, Pain management.

MODULE VI: Day Care Anaesthesia
Special features, Set up, Advantages, Disadvantages, Complications, Future

MODULE VII: Equipment in ICU.
Monitors, ABG, different types of ventilators, CPAP, BiPAP, HFNC, ECMO

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
19	CUTM1828	Post Anesthesia care Unit	3 0 1	4

MODULE-I Setting up of PACU- Definition of PACU, Set up Staff/patient ratio, Monitoring in PACU, Admission and discharge criteria, Criteria for Shifting into PACU, Aldred score, Discharge criteria, Fast trackig

MODULE-II Post Operative Complications And Its Management
Airway obstruction, desideration, bronchospasm, laryngospasm, Unresponsiveness
Neurological complications. - Coma, seizures, CVA(stroke), cerebral hypoxia,
Pulmonary edema, Haemorrhage from the surgical site, vascular complications-. DVT, embolism,(thrombus, air, fat, amniotic)
Trauma to teeth, Headache, Backache, Ocular complications -loss of vision

MODULE-III Shock-Anaphylactic shock, hypovolemic shock management
hypoxia and its management.

MODULE-IV Surgical Procedures

Gynecological/obstetric surgery
General surgeries Procedures
Urological surgery
Orthopedic surgery
Neurosurgery
Ophthalmic surgery
Otorhinolaryngologic and head and neck surgery (ENT)
Cardiac surgery

MODULE-V Post operative pain relief- * Management of postoperative pain- narcotics, NSAID(im/iv), local anesthetics through catheters, transdermal patches.

MODULE-VI: Causes of mortality in PACU- * Mortality -myocardial infarction, arrhythmias, hypoxia, electrolyte imbalance, massive haemorrhage, embolism.

MODULE VII: Fluid Therapy * Fluid and electrolytes * Blood and blood components * Plasma * Allergies and reactions and its management * Informed consent * Use of body tissue and organ transplant * Records in OT , medico-legal cases

Recommended Books

1. *Paul Marino -The ICU Book -4th edition*
2. *Berry, Edna Carnelia & Marie Louis Kohn-Introduction to OR techniques -4th edition*
3. *Brigden, Raymond.J-OT technical-5th edition*
4. *Dixon, Elleen-Theater techniques-5th edition Reference books*
5. *Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014) Elsevier*
6. *Drugs by Pramila Bajaj- clinical anaesthesia-13thedition*

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
20	**CUTM1829**	**Health Care Management**	3 0 1	**4**

Module I: Concept of Health Care and Health Policy

Health in Medical Care, Indigenous systems of Health Care & their relevance, Framework for Health Policy Development.

Module II: Health Organization

Historical development of Health Care System in the third world & India, Organization & Structure of Health Administration in India, Type of Health Organization including International Organizations, Private & Voluntary Health care Provider, Distribution of Health Care Services, Health Care System in Public Sector Organization, Health system of Various Countries.

Module III: Health Policy and National Health Programme

National Health Policy, Drug Policy, National Health Programs (Malaria, T.B., Blindness, AIDS etc.), Evaluation of Health Programs (Developing indicators for evaluation), Medical Education & Health Manpower Development.

Module IV: Health Economics-Fundamentals of Economics

Scope & Coverage, Demand for Health Services, Health as an Investment, Population, health of Economic Development. Economics of Health-Population based health services, Economics of Communicable and Non-Communicable diseases

Module V: Methods & Techniques of Economic Evaluation of Health Program

Cost Benefit & Cost-Effective Methods.

• Household & Health

Health Expenditure & Outcome, Rationale for Government action, Household capacity, income and schooling

Module VI: Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept.

- National Health Policy, Health Insurance, National Health Programmers (Brief Objectives and Scope). Population of India and Family welfare programme in India.

- **Family:** Influence of family on Individuals Health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their Importance to physiotherapy. The family, meaning and definitions. Functions, types of family. Changing family patterns.

Module VII: Culture and Health Disorders, Social Change, Meaning of social changes. Factors of social changes **Human** adaptation and social change, social change and stress. Social changes. Social changes and health programme. The role of social planning in the Improvement of health and rehabilitation

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
21	CUTM1830	Clinical Practices in Hospital - 4	0 4 2	6

1. Ventilator(modes and settings)
2. Non invasive ventilation and invasive ventilation
3. Basic protocols and procedures in ICU
    a. Universal precautions in ICU
    b. Understanding reactions of patients and families
    c. Informed consent
    d. Patient care in ICU
    e. Setting of peripheral line central line catheterization tray
    f. Setting of emergency airway equipments trolley
    g. Setting of emergency drug trolley
    h. Setting of ventilator
    i. Setting of Infusion pumps
    j. Setting of defibrillator
    k. Setting and preparation for arterial blood pressure monitoring line
    l. Setting and preparation of tracheotomy set
    m. Parenteral nutrition in ICU
4. Surgical asepsis- cleaning , scrubbing ,gowning & gloving

5. Setting of OT lights
6. Setting of the nurses instrument trolley
7. Setting of different surgical equipments
8. Hemostats
9. Retractors
10. Scissors and forceps
11. Others
12. Setting & management of laparoscopic trolley
13. Care of endoscopic equipments
14. Care and maintenance of microsurgical instruments
15. Care and maintenance of specialized surgical equipment
16. Instrument planning for various surgical procedures
17. Decontamination of items used in patient care
18. Packing instruments and other items for sterilization
19. Management of post-operative wound infections

S.No	Subject Code	Subject Name		No. Of Credits
22	CUTM1831	Internship & Project - I	Comprehensive viva	20
			TOTAL CREDITS	20

S.No	Subject Code	Subject Name		No. Of Credits
23	CUTM1832	Internship & Project - II	Comprehensive viva	20
			TOTAL CREDITS	20