CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT,ODISHA

SCHOOL OF PARAMEDICS & ALLIED HEALTH SCIENCES

Centurion
UNIVERSITY
Shaping Lives...
Empowering Communities...

BACHELORE OF SCIENCE IN ANAESTHEIA TECHNOLOGY

2021

SYLLABUS

BACHELOR OF SCIENCE IN ANAESTHESIA TECHNOLOGY
Programme structure

BASKET 1	BASKET 2	BASKET 3	BASKET 4	
School Core Courses	**Discipline Core Courses**	**Ability Enhancement Compulsory Course (AECC)** To be selected from University Basket	**Skill Courses** (To be selected from University Basket)	
SC-1 SC-2 SC-3 SC-4	DC-1 DC-2 DC-3 DC-4 DC-5 DC-6 DC-7 DC-8 DC-9 DC-10 DC-11 DC-12 DC-13 DC-14 DC-15 DC-16 DC-17 DC-18 DC-19 DC-20 DC-21	AECC-I AECC-II	SFS-1 SFS-2 SFS-3 SFS-4 SFS-5	**TOTAL CREDITS**
18 Credits	**96 Credits**	**6 Credits**	**20 Credits**	**140 Credits (Minimum Credits required)**

BACHELOR OF SCIENCE IN ANESTHESIA TECHNOLOGY
Basket 1

Sl. No.	CODE	SUBJECT	SUBJECT TYPE (T+P+Pj)	CREDITS
SC-1	CUTM1757	General Anatomy	3+2+0	5
SC-2	CUTM1758	General Physiology	3+2+0	5
SC-3	CUTM1732	Biochemistry	3+1+0	4
SC-4	CUTM1729	Cell Biology	3+0+1	4

Basket II

CODE	SUBJECT	SUBJECT TYPE (T+P+Pj)	CREDITS
CUTM1742	Basic Computer and Information Science	0+2+0	2
CUTM1734	Medical Law and Ethics	2+0+1	3
CUTM1815	Basics of Nursing	3+2+0	5
CUTM1814	Basics in Medical Physics & Electronics	3+0+1	4
CUTM1733	Microbiology	3+2+0	5
CUTM1816	Introduction to anesthesia and OT Technology	3+0+1	4
CUTM1813	Pharmacology	3+0+1	4
CUTM1820	Pharmacology related to Anesthesia Technology	3+0+1	4
CUTM1833	Clinical Hospital Practice for AT- I	0+4+0	4
CUTM1821	Concepts of Diseases and Techniques in Regional & General Anesthesia including Complications medical	3+0+1	4
CUTM1834	Clinical Hospital Practice for AT- II	0+4+0	4
CUTM1824	Anesthesia for Specialty Surgeries	3+0+1	4
CUTM1825	Anesthesia for Patients with Medical disorders	3+0+1	4
CUTM1835	Clinical Hospital Practice for AT- III	0+4+0	4
CUTM1828	Post Anesthesia care Unit	3+0+1	4
CUTM1829	Health Care Management	3+0+1	4
CUTM1822	Anesthesia Techniques Including Complication Same as OT	3+0+1	4
CUTM1827	Anesthesia for Specialties (Including Critical Care Assistance and Ventilation)- Paper II	3+ 0+1	4
CUTM1836	Clinical Hospital Practice for AT- 1V	0+4+0	4
CUTM1837	Internship		12
CUTM1838	Project		12

Basket-1

CUTM1757-GENERAL ANATOMY

Subject Name	Code	Type of course	LTP	Credits
GENERAL ANATOMY	CUTM1757	Theory	**3+2+0**	5

Description:

General anatomy deals with the entire human anatomy with emphasis on different tissues, blood vessels, glands, nerves and the entire central nervous system in particular.

Course outcome

- 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

Course Objective

At the end of the semester, the student should be able to:

- Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.
- Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions.
- Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.

Module -1 INTRODUCTION TO ANATOMY AND SKELETON

Introduction to Anatomy: Sub division of anatomy, terms and terminology, systems of the Body. Skeleton: Bones: function of bones, classification of bones, parts of young bone, development of bone,classification of bones, blood supply bone, cartilage, clinical anatomy

Module –2 MUSCLES & JOINTS

Muscle: types of muscles, structure of striated muscle, naming of muscle, fascicular

architecture ofmuscle, actions of muscle, nerve supply. Joints: Classification, structures of joints, movements, mechanism of lubrication, biomechanics, levers, blood supply, nerve supply, and applied anatomy.

Practice: - Identification of different joints and bones from Charts and Human Skeleton.

Module -3 CIRCULATOTY SYSTEM, LYMPHATIC SYSTEM & SKIN

Circulatory system: Types of circulation of blood, arteries, veins, capillaries, end arteries, applied aspect. Lymphatic system: components, lymph nodes, clinical anatomy Skin: structure of skin, superficial facia, deep facia, clinical aspects

Module -4 UPPER LIMB & LOWER LIMB

(A) Upper extremity: Bony architecture Joints – structure, range of movement Muscles – origin insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy

(B) Lower extremity: Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy

Module -5 THORAX, ABDOMEN & BACK MUSCLES

Thorax: skeleton of thorax, intercostal spaces, pleura, lung, mediastinum, heart: morphology, blood supply, interior of heart, general information about upper respiratory tract (trachea, esophagus,pharynx and larynx) clinical anatomy.

Abdomen: Anterior and posterior abdominal wall, general information about viscera: stomach, liver, pancreas, duodenum, kidney, ureter, urinary bladder, uterus and its adnexa.

Practice: -identification of structure, position, and different parts of Lungs, Heart, Kidney from charts, Models.

Back muscles: Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply. Vertebral column – Structure & Development, Structure & Joints of vertebra Thoracic cage. Radiographic identification of bone and joints Applied anatomy

Practice: - Radiography identification of different architecture joins, structure and position of Bonesfrom Skeleton, Model or PPT.

Module -6 NERVOUS SYSTEM & SPECIAL SENSE ORGANS

Nervous system: parts of nervous system, neurons, peripheral nerves, spinal nerves, summary of cranial nerves, parasympathetic nervous system. Special sense organs: Structure and function of Visualsystem, auditory system, gustatory system, olfactory system.

Module -7 HEAD AND NECK & CENTRAL NERVOUS SYSTEM

Head and neck: scalp, facial muscles, cranial skeleton, triangles of neck, parotid region, temporomandibular joint, muscles of mastication, applied. Central nervous system: General idea about spinal cord, brainstem, cerebrum, cerebellum, ventricular system, diencephalon, blood supply of brain and its applied, meninges and cerebrospinal fluid.

Practice: -Identification of structure and different parts of Central nervous system from chart.

Identification of different blood supply in brain from PPT.

Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).

REFERENCE BOOKS

1. Text book Anatomy & Physiology for nurses by Evelyn Pearce, Publisher Faber amp; Faber.
2. Text book Anatomy and Physiology for nurses by Sears, Publisher Edward Arnold.
3. Anatomy & Physiology- by Ross and Wilson, Publisher Elsevier.
4. Anatomy amp; Physiology: Understanding the human body by Clark, Publisher Jones & Bartlett.
5. Anatomy and Physiology for nurses by Pearson, Publisher Marieb& Hoehn.
6. Anatomy and Physiology by N Murgesh, Publisher satya.

CUTM1758-General Physiology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
General Physiology	CUTM1758	Theory+ Practice	3-2-0	Fundamental Science

Course Objective

- 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 Bio potential and their recording and advanced systems

Course Outcome:

- Students acquire knowledge about the general physiological systems and physiological terminology.
- Student get familiarize with the functionality of different physiological systems
- Students can technically identify the Bio potential signals, their recording and advanced systems.

Course Outline

Module -I

Scope of physiology. Definition of various terms used in physiology. Structure of cell, the 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 -II

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

Module-III

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 -IV

Respiratory system: Various parts of the 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, cyanosis, dyspnoea–asphyxia.

Module-V

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

Module-VI

Digestive System: names of various parts of the digestive system and their functions. structure and functions of the 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-VII

Nervous System: Neuron–Conduction of impulse– synapse–receptor. Sensory organization–pathways and perception, Reflexes–the cerebral cortex– functions. Thalamus–Basal ganglia Cerebellum, the 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. An estimate of Hemoglobin, R.B.C., W.B.C., TLC, DLC, ESR count.
8. Blood indices, Blood grouping, Bleeding & Clotting time

Textbooks

1. Textbook 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.
4. Anatomy& Physiology: Understanding the human body by Clark, Publisher Jones & Bartlett.
5. Anatomy and Physiology for nurses by Pearson, Publisher Marieb & Hoehn.
6. Anatomy and Physiology by N Murgesh, Publisher Satya

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CUTM1729- Cell Biology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Cell Biology	CUTM1729	Theory+ Project	3-0-1	Fundamental Science

Course Objective

- Determine the parts of the cell membrane and the cell wall
- Distinguish the types and mechanism of mutation
- Compare and contrast the events of cell cycle and its regulation
- Understand the dynamic character of cellular organelles

Course outcome

- Describe the fundamental principals cellular biology
- Develop a deeper understanding of cell structure and how it relates to cellfunctions.
- Understand how cells grow, divide, and die and how these important processes are regulated.
- Understand cell signaling and how it regulates cellular functions. Also how its dis-regulation leads to cancer and other diseases

Course Outline Module –I (12 Hr)

An Overview of Cells: History, Cell theory, Structure and Function of Cell and its Organelles: Biological membranes - Nucleus - Nuclear envelope, Nucleolus, Mitochondria, Chloroplasts, Lysosomes, Gloxysomes and Peroxisomes, endoplasmic reticulum, ribosomes, Golgi complex (Structural organization, function, marker enzymes of the above organelles), Cell types: prokaryotes vs. eukaryotes; from single cell to multi-cellular organism; Different molecules of cell- water, salt and mineral ions etc.

Module- II (14 Hr)

Cell cycle and its regulation, Cellular communication and cell mobility: Cell cycle: G0/G1, S, G2 and M phages (Cell Division: Mitosis, meiosis and cytokinesis); regulation of cell cycle; cell adhesion and roles of different adhesion molecules, gap junctions, Extra- Cellular Matrix (ECM), Cell-cell interaction and cell- ECM interaction, The cytoskeleton, Microtubule- based movement and microfilament -based movement.

Module-III (14 Hr)

Cell signaling, Programmed Cell Death (Apoptosis) and Cancer: Hormones and their receptors, cell surface receptor, signaling through G-protein coupled receptors (G-PCR), Tyrosine Kinase, signal transduction pathways, second messengers, regulation of signaling pathways, bacterial and plant two- component systems, bacterial chemotaxis, Intrinsic and Extrinsic apoptotic pathway, Caspase enzyme, Biology and elementary knowledge of development and causes of cancer; Tumor viruses, Oncogenes and tumor suppressor genes.

Suggested Readings:

1. The Cell a Molecular Approach (4th Edition) by Cooper & Hausman https://www.thebiomics.com/books/cell-biology/cell-molecular-approach-cooper-and-hausmn- 4th-ed.html
2. Molecular Biology by Friefelder David, Publisher Narosa www.alibris.com/Molecular-Biology-David..
3. Introduction to Cell biology by John K Young, World Scientific publishing company www.overdrive.com/.../introduction-to-cell-biology
4. Introduction to biology,3rd tropic edition by D G Maackean www.amazon.com/Introduction-Biology-D-G-Mackean/.

CUTM1732- Biochemistry

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Biochemistry	CUTM1732	Theory+ Practice	3-1-0	Fundamental Science

Course Objective

- To understand the concept of metabolism of carbohydrates
- To understand the significance of amino acids, proteins
- Use of enzymes in enhancing metabolic reactions
- Role of lipids

Course outcome

- After completion of the course the student will be developed a very good understanding of various biomolecules which are required for development and functioning of cells.
- Would have understood the significance of carbohydrates in energy generation and as storage food molecules for cells.
- They would have understood the significance of proteins and enzymes in accelerating various metabolic activities.
- The conceptual understanding of the subject provides opportunities for skill enhancement and scopes for higher education.

Course Outline

Module- I

Structure of enzyme: Apoenzyme and cofactors, prosthetic group-TPP, coenzyme NAD, metal cofactors, Classification of enzymes.

Mechanism of action of enzymes: active site, transition state complex and activation energy. Lockand key hypothesis, and Induced Fit hypothesis.

Enzyme inhibition, enzyme kinetics.

Diagnostic value of serum enzymes: Creatinine kinase, Alkaline phosphatase, Acid phosphatase,LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc.

Practice: Study of effect of temperature on enzyme activity Study of effect of pH on enzyme activity

Module- II

Carbohydrates: Biomedical importance & properties of Carbohydrates, Classification,

Families of monosaccharides: aldoses and ketoses, trioses, tetroses, pentoses, and hexoses. Stereo isomerism of monosaccharides, epimers, Haworth projection formulae for glucose; chair and boat forms of glucose.

Metabolism: Glycogenesis & glycogenolysis, Glycolysis, citric acid cycle & its significance, Components of respiratory chain, energy relationships during cell respiration, types of respiration. HMP shunt & Gluconeogenesis, regulation of blood glucose level.

Practice: Estimation of Glucose in urine Estimation of Glucose in blood

Module- III

Amino acids: Classification, essential & non-essential amino acids. Chemistry of Proteins & their related metabolism, Classification, biomedical importance.

Metabolism: Ammonia formation & transport, Transamination, Decarboxylation, Urea cycle, metabolic disorders in urea cycle, catabolism of amino acids.

Practice: Estimation of Protein in urine Estimation of Protein in blood

Module- IV

Chemistry of Lipids & their related metabolism: Classification, biomedical importance, essential fatty acids. Brief out line of metabolism: Beta oxidation of fatty acids, fatty liver, Ketogenesis, Cholesterol & it's clinical significance, Lipoproteins in the blood composition & their functions in brief, Atherosclerosis.

Diabetes mellitus: its types, features, gestation diabetes mellitus, glucose tolerance test, glycosuria,Hypoglycaemia& its causes.

Practice: Estimation of Bile pigment in urineEstimation of Bile salts in urine

Suggested Readings:

1. Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil(2018) Harper's Illustrated Biochemistry. Mc Graw Hill.
2. (e-Book link: https://www.pdfdrive.com/harpers-illustrated-biochemistry-d176838999.html)
3. Nelson DL and Cox MM. (2008). Lehninger Principles of Biochemistry, 5th Ed., W.H. Freeman and Company. (e-Book link: https://www.pdfdrive.com/lehninger-principles-of-biochemistry-5th-edition-d164892141.html)
4. Donald Voet, Judith G. Voet (2011) Biochemistry 4th Edition. Wiley Publishers. (e-Book link: https://www.pdfdrive.com/biochemistry-4th-edition-e165192126.html)
5. Jeremy M. Berg, John L. Tymoczko, LubertStryer. Biochemistry 7th Edition. W.H. Freeman and Company, New York. (e-Book link: https://www.pdfdrive.com/biochemistry-seventh-edition-e167675390.html

Basket-2

CUTM1742- Basic Computer and Information Science

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basic Computer and Information Science	CUTM1742	Practice	0-2-0	Fundamentals of Computer

Objective

- Identify the function of computer hardware components.
- Identify the factors that go into an individual or organizational decision on how to purchase computer equipment.
- Identify how to maintain computer equipment and solve common problems relatingto computer hardware.
- Identify how software and hardware work together to perform computing tasks and how software is developed and upgraded
- Identify different types of software, general concepts relating to software categories, and the tasks to which each type of software is most suited or not suited.

Course outcome

- Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components.
- Understand the difference between an operating system and an application program, and what each is used for in a computer.
- Describe some examples of computers and state the effect that the use of computer technology has had on some common products

Course Outline

Module- I Introduction to computer: introduction, characteristics of computer, block diagram of computer, generations of computer. Types of Input output devices. Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices.

Module- II

Introduction to MS-Word: introduction, components of a word window, creating, opening and insertingfiles, editing a document file, page setting and formatting the text, saving the document,

spell checking,printing the document file, creating and editing of table, mail merge. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

Module- III

Introduction to MS-DOS: History of DOS, features of MS-DOS, MS-DOS Commands (internal and external). Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.). Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid). Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.

Suggested readings:

1. Objective Computer Awareness
2. Computer Networking (Global Edition)

CUTM1816- Introduction to anesthesia and OT Technology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Introduction to anesthesia and OT Technology	CUTM1816	Theory+ Project	3-0-1	Fundamental Science

Course Objective

- Introduction to anaesthetic equipment.
- Pre anaesthetic care
- Post anaesthetic care.
- Anaesthetic drug identification.
- Necessary arrangement for patient bed.

Course Outcomes: On completion of this course, the successful students should be able to:

- Able to set-up pre anaesthetic patient care.
- Able to set-up post anaesthesia care.
- Preparation of routine drug for elective surgery.
- Students will be skilled to handling and maintenance of the necessary equipments.
- Students will learn all vital signs for-Patient monitoring.

Course Outline

Module I

Introduction To Anesthesia: History of Anesthesia: Prehistoric (Ether) era, Inhalational anesthetic era, Regional anesthetic era, Intravenous anesthetic, Modern anesthetic era

Medical Gas Supply: Compressed gas cylinders, Colour coding, Cylinder valves, Cylinder storage, pin index, Diameter index safety system, Gas piping system, Air compressors, Oxygen Concentrators, Alarms & safety devices.

Module II:

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

Gas Administration Devices: Simple oxygen administration device, Methods of controlling gas flow, Reducing valves, Flow meters, Regulators, Flow restrictors

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:

Boyle's Machine & its functioning. Boyle's vaporizer. Magill's breathing circuit, Bains breathing circuit, pediatrics anesthesia circuit. Gas cylinders and flow meters. Carbon dioxide absorption contester. Suction apparatus-foot operated, electrically operated. Ambubag laryngoscope endotracheatubes. Catheters, face masks, venti-mask.

Module VI

MONITORING

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

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 Nagelhoutand Plans-5th edition
2. Clincalanaesthesia by Pramila Bajaj-5th edition
3. Wards textbook of anaesthesia

CUTM1824- Anesthesia for Specialty Surgeries

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Anesthesia for Specialty Surgeries	CUTM1824	Theory+ Project	3-0-1	Fundamental Science

Course Objective

- Introduction to different anaesthesia techniques.
- General Anaesthesia-for orthopaedic, cardiac and other general surgeries.
- Spinal Anaesthesia, Local anaesthesia for Obstetric.
- Patient positioning, transferring to ICU/Ward
- Laparoscopic surgeries and complications.
- Pain Management-Burn management

Course Outcome

- Students will learn about different anaesthesia techniques
- They will get knowledge about different surgeries
- Students will get to know about- Spinal Anaesthesia for Obstetric
- Students will be skilled to handling and maintenance of the necessary equipment's.
- Students will learn about pain and burn management
- They will get know about laparoscopic surgeries and surgery related complications.

Course Outlines

MODULE I

Neuroanaesthesia, orthopaedics, plastic &reconstructive surgeries Neuro Anaesthesia * Premedication* Special investigation - CT, Angiography and MRI * Checklist * Induction of a patient * Reinforced Endotracheal tubes * Postioning in neuro surgery * I.C.P. -normal values, factors increasing icp& methods to reduce icp in the OT * Air embolism * Reversal of the patient * Transferring to I.C.U. / Ward Orthopaedic Surgery * Complications During Orthopaedic procedures-fat embolism ,massive haemorrhage,tourniquet complications * Radiation hazard Plastic And Reconstructive Surgery And Vascular Surgery * Complications during revascularisation and its management * Recognition of compartment syndrome * Burns -types and initial management-anaesthetic challenges * RAE tubes

MODULE-II

Obstetric Anaesthesia, Paediatric Anaesthesia- Obstetric Anaesthesia * Differences between a pregnant and a non-pregnant lady * Risks for anaesthesia.-difficult airway, supine hypotension syndrome * Check list * Regional vs general anaesthesia * Induction / maintenance and recovery . * Resuscitation of the new born, apgar score * Reversal and extubation * Emergencies - manual removal of placenta - A.P .H. - P.P.H. - Rupture uterus - Ectopic Pregnancy * Amniotic fluid embolism Paediatric Anaesthesia * Theatre setting * Check list * Premedication - modes * Induction * Intubation- Securing the ETT * Reversal

&extubation - Problems and its management * Transferring / ICU management * Pain management

MODULE III

Cardiac Anaesthesia, ENT Surgeries- 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 * Cardiopulmonary bypass -indication and its function * I.C.U management. * Chest tube management *

MODULE IV

ENT Anaesthesia* Anaesthesia for adenotonsillectomy-challenges, positioning, throat packing and removal of the pack * Anaesthesia for mastoidectomy& FESS-methods to minimize bleeding * Anaesthesia for Bronchoscopy and oesophagoscopy-challenges in anaesthetising for these procedures

MODULE V: Urology,anaesthesia outside OR, day care surgeries, laparoscopic and geriatric anaesthesia-Urology * Different endoscopic procedures in urology * Types of irrigation fluids- glycine,normal saline * Complications of TURP * Lithotomy position and its complications Anaesthesia Outside the O.R. Problems of anaesthetising patients in * Endoscopy * Cath Lab * Radiology -CT,MRI

MODULE VI

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

Reference books

1. Clinical Anaesthesia by Pramila Bajaj-3rd edition
2. Lee's Synopsis of Anesthesia-13th edition

CUTM1825- Anesthesia for Patients with Medical disorders

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Anesthesia for Patients with Medical disorders	CUTM1825	Theory+ Project	3-0-1	Fundamental Science

Course Objective

- Introduction to different medical disorders.
- Anaesthesia in Diabetes Mellitus-insulin preparation.
- Anesthesia in Respiratory disorder-COPD/Bronchospasm.
- Coronary artery disease-heart attack-anaesthesia
- Renal and liver diseases- anaesthesia
- Intra-operative complications.

Course Outcome

- Introduction to different medical disorders- definition, causes.
- They will get knowledge about different surgeries having medical disorders
- Students will get to know about- different Anaesthesia techniques for hypertension and hypotrnsion
- Students will be skilled to handling and maintenance of the necessary equipment's.
- Students will learn about anaesthesia drugs and emergency drugs and intra-operative complications
- They will get know about renal, coronary artery surgeries and surgery related complications.

Course Outline

MODULE I

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

MODULE II

Diabetes Mellitus: Diabetes -insulin preperations, methods to reduce blood sugar levels, complications of uncontrolled diabetes intraoperatively.

MODULE III

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

Coronary artery diseases, thyroid diseases- 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

Thyroid disorders-causes of hyper and hypothyroidism, challenges of anaesthetising a thyroid patient, thyroid storm and its management, complications after thyroidectomy

MODULE–VI

Obesity, Renal and Liver Failure-Obesity-challenges of anaesthetising an obese patient.

MODULE VII

Renal failure-anaesthetic challenges in renal failure patient, intraoperative complications in renal failure patients and its management, important anaesthetic challenges during renal transplant * Jaundice-intraoperative complications in a liver failure patient.

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

CUTM1822- Anesthesia Techniques Including Complication

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Anesthesia Techniques Including Complication	CUTM1822	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- Introduction to first successful clinical demonstration: Balanced anaesthesia.
- Pre-op preparation: Pre anaesthetic assessment.
- Intraoperative management and Postoperative complications & management

Course Outcomes:

- Introduction to anaesthesia,Ten golden rules of anaesthesia
- To setup the requirement for Pre-op preparation: Pre anaesthetic assessment
- Awareness about radiation safety and radiation protection
- To setup the required equipments for biopotential Recording Systems
- Students will learn about Intraoperative management and Postoperative complications & management.

Course Outlines

Module I

To setup the required equipments for general anaesthesia, spinal, epidural, nerve block.

Module II

Monitoring during anaesthesia and complications:

Minor Sequelae

Nausea & vomiting,Sore throat, Laryngeal granuloma, Neurological complications, Awareness, Vascular complications, Trauma to teeth, Headache, Backache Ocular complications. ,Auditory complications .

Module III

Monitoring and diagnostic procedures in ICU

Major Catastrophes

Mortality, Causes of death , Cerebral damage, Prevention.

Intensive Care: Central venous access, ECG monitoring, Invasive hemodynamic monitoring

Module IV

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

Module V

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

Module VI
Anaesthetic consideration in
Endocrine disease: Pheochromocytoma b) Renal disease: Urolithiasis, TURP

Module VII
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

Reference Books:

1. Davidson's Principles and Practice of Medicine - Elsevier Publications Harrison's Principle of Internal Medicine

CUTM1827- Anaesthesia for specialties (Including Critical Care Assistance and Ventilation) Paper – II

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Anesthesia for specialties (Including Critical Care Assistance and Ventilation) Paper – II	CUTM1827	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- To setup the required equipments for cardiac anaesthesia.
- Able to set-up the required equipments for neuro anaesthesia.
- Anaesthesia in trauma and shock
- To setup for day care anaesthesia
- Managing anaesthesia outside OT
- Handling the paediatric anaesthesia equipment and know the techniques of paediatric anaesthesia.

Course Outcomes:

- Able to set-up all equipments for cardiac and obstratic anaesthesia.
- They will get knowledge about required equipment and handling for neuro anaesthesia.
- Students will get to know about- anaesthesia techniques for traumatised patient.
- Students will be skilled to managing OT for outside anaesthesia and day care anaesthesia.
- Students will learn about Handling the paediatric anaesthesia equipment and know the techniques of paediatric anaesthesia.
- Students will learn about the protocol during difficult intubation and extubation also other complications regarding anaesthesia.

Course Outline

MODULE I

Cardiac Anaesthesia –

NYHA classification, Arrhythmias, Angina, Dyspnoea, Premedication, Setting up of monitoringsystem, Monitoring – invasive and non-invasive,

Getting ready for the case, Induction of cardiac patient, precautions to be taken, Transferring thepatient 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 Positioningin 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

Paediatric 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

Amaesthesia Outside the O.R.

Situations, Cath lab, radiology and imaging Science Technology natural calamities, E.C.T., Features, Shortcomings, Complications

CUTM1821- Concepts of Diseases and Techniques in Regional & General Anesthesia including complications medical

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Concepts of Diseases and Techniques in Regional & General Anesthesia including complications medical	CUTM1821	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- Introduction to first successful clinical demonstration: Balanced anaesthesia.
- Pre-op preparation: Pre anaesthetic assessment.
- Intraoperative management and Postoperative complications & management

Course Outcomes

- Introduction to anaesthesia,Ten golden rules of anaesthesia.
- To setup the requirement for Pre-op preparation: Pre anaesthetic assessment.
- Awareness about radiation safety and radiation protection.
- To setup the required equipments for biopotential Recording Systems.
- Students will learn about Intraoperative management and Postoperative complications & management.

Course Outline

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, Pase 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

- Routine – Urine, E.C.G, Chest x-ray
- Patient – Informed consent, NPO
- 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
- Drugs – Emergency drugs, Anaesthetic drugs

Module IV: Intraoperative management and Postoperative complications & management

- 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.
- Recovery room – Set up, Things needed, Problems
- Complications, Obesity, Anaemia

Module V: Minor sequelae and Major catastrophes

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

ModuleVI:

ANAESTHETIC consideration in

- Cardiac disease – CAD, Valvular heart disease, congenital heart disease, Hypertension
- Respiratory disease – COPD, Bronchial Asthma
- Endocrine disease – DM, Thyroid dysfunction
- Renal disease – CRF
- Obesity

Module VII:

Water Electrolyte & Acid Base Disturbances Distribution of Body Water, Dehydration Hyperkalemia,Hypokalemia. Sodium, Calcium Acid Base Disturbances – Types and Treatment. **Endocrine Disease**: Diabetes Mellitus, Thyroid Dysfunction – Thyrotoxicosis, HypothyroidismAdrenal Gland Dysfunction Diabetes Insipidus.

CUTM1733- Microbiology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Microbiology	CUTM1733	Theory+ Practice	3-2-0	Fundamental Science

Course Objective

- To know various Culture media and their applications and also understand various physical and chemical means of sterilization
- To know General bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi and virus
- To master aseptic techniques and be able to perform routine culture handling tasks safely and effectively

Course outcome

- This study demonstrates the theory and practical skills in microscopy and their handling techniques and staining procedures.
- Understanding the details of microbial cell organelles.
- Provides knowledge on growth of microorganism.
- Provides knowledge Culturing microorganism.

Course Outline

Module -1(14 Hours)

Microbiology: Definition, history, host- microbe relationship, and safety measures in a microbiology laboratory. Morphology of bacterial cell wall, Bacterial anatomy (Bacterial cell structure: including spores, flagella, pili and capsules). Sporulation. Classification of bacteria according to cell wall and shape (arrangement), Classification of micro-organisms. Growth and Nutrition of Microbes**:** General nutritional requirements of bacteria, Bacterial growth curve Practice:

1. Handling of Microscope
2. To learn techniques for Inoculation of bacteria on culture media.
3. To isolate specific bacteria from a mixture of organisms.

Module-2 (11 Hours)

Sterilization: Definition, sterilization by dry heat, moist heat (below, at & above 100º C),

Autoclave, Hot air oven, Radiation and Filtration, preventive measures, controls and sterilization indicators. Use of laminar flow in sterilization.

Antiseptics and Disinfectants: Definition, types, properties, mode of action and use of disinfectants and antiseptics, efficiency testing of disinfectants.

Practice:

1. To demonstrate simple staining (Methylene blue)
2. Bacterial identification: To demonstrate reagent preparation and procedure for Gram stain, Z-N staining, Capsule staining, Demonstration of flagella by staining methods, Spore staining
3. To demonstrate spirochetes by Fontana staining procedure

Module-3 (15 Hours)

Staining techniques: Methods of smear preparation, Gram stain, AFB stain, Albert's stain and special staining for spore, capsule and flagella, Culture Media, Liquid and solid media, defined and synthetic media, routine laboratory media (basal, enriched, selective, enrichment, indicator, and transport media).Different Culture, media their preparation and uses in microbial growth.

Practice:

1. Biochemical tests for identification of bacteria
2. Preservation of stock cultures of bacteria
3. Antibiotic susceptibility test

Suggested Reading:

1. Medical Laboratory Technology by Kanai Lal Mukherjee; Tata McGraw Hill, New Delhi
2. Microbiology by Prescott
3. An Introduction to Medical Laboratory Technology by FJ Baker; Butterworth – Heinemann;Oxford
4. Practical Book of Medical Microbiology by Satish Gupta; JP Brothers, New Delhi
5. Medical Laboratory Manual for Tropical Countries Vol. I and II by Monica Cheesbrough; Cambridge University Press; UK
6. Textbook of Medical Laboratory Technology by Praful B Godkar; Bhalani Publishing House,Mumbai
7. Text book of Medical Microbiology by Gruckshiank

CUTM1814-Basics in Medical Physics & Electronics

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basics in Medical Physics & Electronics	CUTM1814	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- Introduction to Health and patient care with respect to radiation aspects.
- To setup the required equipments for interventional procedures
- Awareness about radiation safety and radiation protection

Course Outcomes:

- Introduction to Health and patient care with respect to radiation aspects.
- To setup the required equipments for interventional procedures
- Awareness about radiation safety and radiation protection
- To setup the required equipments for biopotential Recording Systems
- Students will learn about imaging techniques with respect to anaesthesia and surgical procedure.

Course Outline

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 nuclear physics and radioactivity, Radioactive radiations – 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 – Ultrasound and generation of ultrasound.

Module III: Nuclear Physics Radioactivity: 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 : Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various biopotential signals – Working principles of bio potential recording systems – Electrocardiography– Electroencephalograph –Electromyography.

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 MichaelNorris, John Wiley & Sons (2005).

CUTM1734 - Medical Law and Ethics

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Medical Law and Ethics	CUTM1734	Theory+ Project	2-0-1	Fundamental Science

Course Objective

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

Course outcome

- The ethical underpinnings of the law as it relates to medicine
- The law of negligence in the context of the provision of healthcare, Legal and ethical issues surrounding end and beginning of life decisions
- The maintenance of professional standards in the healthcare profession, and The role of policy in the formation of law as it relates to medicine.

Course Outline

Module-1

1. The Indian medical council act, 2. Medical council of India (functions),3. Functions of state medicalcouncils, 4. The declaration of Geneva

Module-2

1. Duties of medical practioners 2. Regarding red cross emblem 3. Professional secrecy 4.Privileged communication.

Module-3

1. Professional negligence 2. Medical mal occurrence 3. Contributory negligence 4. Criminal negligence

Module-4

1. Corporate negligence 2. Ethical negligence 3. Precautions against negligence 4. difference between professional negligence and infamous conduct.

Module-5

1. Malpractice litigation involving various specialities 2. Prevention of medical negligence

3.supreme court of India guidelines on medical negligence 3. The therapeutic misadventure 4. Vicarious liability

Module-6

1. Products liability 2. medical indemnity insurance 3. Medical records 4. Consent in medical practice

Module-7

1. Euthenesia 2. Deaths due to medical care 3. Malingering

Text books

Medical Law and Ethics by Shaun D Pattinson, 5 th edition, 2017.

CUTM1813-Pharmacology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Pharmacology	CUTM1813	Theory+ Project	3-0-1	Fundamental Science

Course objectives

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

Course outcomes:

At the end of the course students will be be knowledgeable in the following areas:

1. Pharmacokinetics and pharmacodynamics of drugs
2. Drugs and their actions on different body systems
3. Detailed study about different anesthetic drugs

Course Outlines

Module -I: General Pharmacology Part I

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

Module -II: General Pharmacology Part II

Pharmacodynamics – Mechanisms of drug actions, drug synergism and antagonism. Adverse Drug Reactions, Drug Interactions

Module -III: General Pharmacology Part II

Receptor pharmacology, Drug Nomenclature and Essential Drugs Concept

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: Chemotherapy agents and other antibiotics

Chemotherapy of infections, Definition - Classification and mechanism of action of antimicrobial agents. Combination of anti microbial agents. Chemo prophylaxis. Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin

TEXT BOOKS:

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

CUTM1815- Basics of Nursing

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basics of Nursing	CUTM1815	Theory+ Practice	3-2-0	Fundamental Science

Course Objective:

- Introduction to Health and patient care.
- To setup the required equipments for First Aid and emergencies.
- Able to know the job role of technicians.
- Awareness about personal hygiene and social responsibilities.
- Health Education and management.
- Basic nursing knowledge
- Providing patient safety and quality control of the patient.

Course Outcome:

- Introduction to Health and patient care, definition of health.
- They will get knowledge about quality control and patient safety.
- Students will get to know about- First Aiding and how to tackle emergency situations.
- Students will be skilled about personal hygiene and social responsibilities
- Students will learn about Basic nursing knowledge.
- Students will learn about the Health Education and management.

Course Outline

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 andevaluation.

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 Assisting 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: Personal 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.

CUTM1829- Health Care Management

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Health Care Management	CUTM1829	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- Introduction to the concept of health care and health policy.
- Health Policy and National Health Programme.
- Methods & Techniques of Economic Evaluation of Health Programme.

Course Outcome:

- Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept
- Able to know Health Policy and National Health Program
- Students will get to know Economics-Fundamentals of Economics

Course Outline

Module I

Concept of Health Care and Health Policy

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

Module II

Health Organisation

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

CUTM1820-Pharmacology Related to Anesthesia Technology

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Pharmacology Related to Anesthesia Technology	CUTM1820	Theory+ Project	3-0-1	Fundamental Science

Course objectives:

Students learn about various drugs acting on different body systems and about the anesthetic drugs.

Course Outcome:

- Pharmacokinetics and pharmacodynamics of drugs
- Drugs and their actions on different body systems
- Detailed study about different anesthetic drugs
- Detailed study about different pre-medication, induction, maintenance and reversal drugs

Course Outline

Module I: Respiratory system

Pharmacotherapy of respiratory disorders – Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone Pharmacotherapy of bronchial asthma. Pharmacotherapy of cough. Mucolytic agents. Corticosteroids – Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.

Module II: Cardio vascular system

Cardiovascular drugs- Enumerate the mode of action, side effects And therapeutic uses of the following drugs. a. Antihypertensives Beta Adrenergic antagonists. Alpha Adrenergic antagonists. Peripheral Vasodilators. Calcium channel blockers. Antiarrhythmic drugs c. Cardiac glycosides, drugs used in congestive cardiac failure - mechanism of action, uses and adverse effects

Module III: General anaesthetics

Anaesthetic agents. Definition of general and local anaesthetics. Classification of general anaesthetics. Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents. Intravenous general anaesthetic agents. Local anaesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.

Module IV: Opioid Analgesics

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

Module V: Antihistamines and Antiemetics

Antihistamines and antiemetics - Classification, Mechanism of action, adverse effects, Preparations, dose and routes and administration.

Module VI: Drugs for CNS

CNS stimulants and depressants - Alcohol, Sedatives, hypnotics and narcotics. CNS stimulants - Neuromuscular blocking agents and muscle relaxants.

Module VII: Other Drugs

Miscellaneous. IV fluids (Nacl, RL, DNS, hemacel, heparin) - various preparations and their usage, Drugs used in metabolic and electrolyte imbalance, Mechanism of action, uses and adverse effects of antitubercular drugs

TEXT BOOKS:

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

CUTM1828- Post Anaesthesia care Unit

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Post Anaesthesia careUnit	CUTM1828	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- Introduction to post anaesthesia and pre-anaesthesia care unit.
- Pre-op preparation, Pre anaesthetic assessment.
- Intraoperative management and Postoperative complications & management

Course Outcome

- Introduction to Health and patient care, definition of health.
- They will get knowledge about quality control and patient safety.
- Students will get to know about- First Aiding and how to tackle emergency situations.
- Students will be skilled about personal hygiene and social responsibilities
- Students will learn about Basic nursing knowledge.
- Students will learn about the Post anaesthesia amd pre-anaesthesia care unit.

Course Outline

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 tracking

MODULE II
Common complications & its management in PACU, Post Operative Complications and Its Management * Nausea & Vomiting * Sore throat -hoarseness of voice, loss of voice

MODULE III
Airway obstruction, desaturation, bronchospasm, laryngospasm, * Unresponsiveness * Neurological complications. - coma, seizures, CVA(stroke), cerebral hypoxia, * Pulmonary edema * Haemorrhage from the surgical site * Vascular complications-. DVT, embolism,(thrombus, air, fat, amniotic)

MODULE IV
*Trauma to teeth * Headache * Backache * Ocular complications -loss of vision * Hypotension, hypertension, * Bradycardia, tachycardia, arrhythmia, myocardial infarction * Hypoglycemia, hyperglycemia * Electrolyte imbance-hyponatremia, hypokalemia, hyperkalemia

MODULE V

Post operative pain relief- * Management of postoperative pain- narcotics, NSAID (im/iv), local anaesthetics 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 Legal Responsibilities * Identification of patient * Identification of right part to be operated * Informed consent * Use of body tissue and organ transplant * Care of sponges and instruments * Records in OT and its medico-legal importance.

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

CUTM1833- Clinical Hospital Practice for AT – I

Subject Code	Name of the Subject	Subject Type (T- Pr- Pj)	No. Of Credits
CUTM1833	Clinical Hospital Practice for AT – I	0+4+0	4

Course Objective

- To understand the basics of hospital practices
- Preliminary understanding of preparations required for a surgery

Course Outcome:

- The student will learn about the pre-operative procedures and sterilization required before performing a surgery
- The student will acquire knowledge about the investigations to be performed before a surgical condition
- The student will acquire the understanding of vitals, emergency drug use, infusion on a patient during surgical condition

1. **Methods of cleaning and sterilization of anesthetic equipment's**
2. **Pre-operative preparation**
   - Pre Anaesthetic Assessment
   - History of present illness
   - Past history with emphasis on previous illness and surgery
   - Personal history – Smoking, alcohol
   - Physical examination – General and systemic
3. **Written information and written consent**
4. **Premedication: Aims**
   - Narcotics
   - Antihistaminic
   - Antacids
   - Others - NTG
5. **Investigations**
   - ECG
   - Chest X-ray
   - ABG
   - MRI
   - Monitor pulse and BP
6. **Criteria used for accepting the case for surgery**
7. **Equipment**
   - Checking the machine, laryngoscopes, tubes, airways etc. suction apparatus, oxygenCylinder, anaesthetic drugs and emergency drugs.
8. **Monitoring system**

9. Induction – Anaesthesia

- Endotracheal intubation, confirming the tube position and securing the tubeMaintenance of anaesthesia
- Fluid / Blood and electrolyte balance
- Reversal from anaesthesia – drugs used

10. Preparations

- Identification
- Consent
- NPO
- Prosthesis
- Lab results
- Consultation
- Blood

11. Testing

Machine

- Ga
  s
  sup
  ply
- Flow meters
- O2 bypass
- Valves
- Vaporises

12. Emergency Drugs

a) Atropine
b) Epinephrine
c) Isoprenaline
d) Ephedrine
e) Aminophylline
f) Hydrocortisone
g) Soda Bicarb
h) Dopamine
i) Norepinephrine
j) Dobutamine

13. I.V Infusion

a) Site of cannulations
b) Finding a vein
c) Technique of venepuncture
d) Special difficulty

14. Protection of the Patient

a) The eyes
b) The ears
c) The skin
d) The lips, tongue, teeth
e) Veins, arteries
f) Peripheral nerves

15. Intubation

a) Choice of ETT
b) Choice of Laryngoscope
c) Techniques of intubation
d) Complications
e) Difficult intubation

16. In the recovery room

a) Patient identification
b) Diagnosis & Surgery
c) Type of anesthesia used
d) Fluid balance
e) B P
f) Any complications
g) Instructions about ventilation, vital sings

17. Problems in RR

a) B.P. hypo, hypertension
b) HR- Tachy, bradycardia
c) Pallor, cyanosis, dyspnea
d) Restlessness
e) Neurological- Seizures Sweating

CUTM1834- Clinical Hospital Practice for AT – II

S.No	Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
4	CUTM1834	Clinical Hospital Practice for AT - II	0 4 0	4

Course Objective:

- To understand the basics of patient preparation during surgical conditions
- Preliminary understanding of anaesthetic conditions

Course Outcome:

- The student will learn about the pre operative procedures required before performing a surgery
- The student will acquire knowledge about the investigations to be performed before a surgical condition
- The student will acquire the understanding of important anaesthetic procedures to be performed for a surgery

Course Outline

1. Drugs for practical:

Thiopentone	Potassium chloride
Propofol	5% dextrose
Ketamine	Normal saline
Etomidate	Hetastarch
Atropine	Heparin
Glycopyrrolate	Low molecular weight heparin
Ondansetron	Fentanyl
Metaclopramide	Pethidine
Midazolam	Pentazocine
Diazepam	Morphine62
Succinylcholine	Halothane
Vecuronium	Sevoflurane
Rocuronium	Isoflurane
Atracurium	Desflurane
Dexamethasone	Paracetamol
Hydrocortisone	Tramadol
Ranitidine	Mephentermine
Sodium citrate	Neostigmine
Xylocaine,	bupivacaine (all preparations)
Adrenaline	Noradrenaline
Propanolol	Xylocard
Labetolol	Esmolol

Dopamine	Dobutamine
NTG, SNP,	Aminophylline

2. ANAESTHETIC consideration in

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. Emergence, Termination and Recovery
g. Reversal
h. Oropharyngeal toilet
i. E T Suction
j. Deflation of the cuff
k. Removal of the tube
l. Transfer of the patient

CUTM1835-Clinical Hospital Practice for AT - III

Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
CUTM1835	**Clinical Hospital Practice for AT - III**	0 4 0	**4**

Course Objective:

- To understand the basics of patient preparation during surgical conditions
- Preliminary understanding of providing anaesthesia to a patient during surgery

Course Outcome:

- The student will learn about the pre operative procedures required before performing a surgery
- The student will acquire the understanding of important anaesthetic procedures to be performed for a surgery
- The student will acquire knowledge of the choice of drugs for surgical preparation

Course Outline

I. A. Equipments:

1. Contents of cvc set,
2. IV cannulation technique,
3. Dilution of drugs,
4. Setting up of infusion and syringe pumps, storage of blood and blood products,
5. Storage of drugs,

II. B. Position for spinal/epidural

1. usage of peripheral nerve stimulator and ultrasound,
2. procedure of all the above mentioned blocks,
3. items included in LP set
4. asepsis

Spotters Types of spinal needles Touhy epidural needle Items included in LP set Epidural catheter set- contents Peripheral nerve stimulator Stimuplex needles Drugs used in regional anaesthesia+adjuvants Atropine, ephedrine, mephentermine, Lipid emulsion

- Checking blood pressure, checking CBG, process of nebulisation, position for thyroid surgery. Difficult intubation cart, difficult airway management, setting up of IBP/CVP

III. DRUGS:

- Antihypertensive drugs-losartan, amlodepine, telmisartan, atenolol, Insulin preparation Antiepileptic drugs-midazolam, phenytoin. Clopidogrel, aspirin, Nebulizer, inhalers, rotahelers,
- levosalbutamol, ipratropium bromide, deriphylline Sphygmomanometer Furesomide, mannitol,methyl prednisolone, albumin
- Discussion on management of Diabetes and hypertension

CUTM1836-Clinical Hospital Practice for AT - IV

Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. Of Credits
CUTM1836	**Clinical Hospital Practice for AT - IV**	0 4 0	**4**

Course Objective:

- To learn monitoring of surgical conditions
- Understanding of providing anaesthesia to a patient during surgery

Course Outcome:

- The student will learn about monitoring a patient at the OT
- The student will acquire the understanding of vital parameters in PACU
- The student will acquire knowledge on preparation of patient for anaesthesia during MRI
- Understanding of use of defibrillator

Course Outline

1. Checking CBG,
2. insertion of IV cannulas,
3. functioning of syringe and infusion pump,
4. Working of laryngoscopes, insertion of oropharyngeal airways,
5. injecting drugs through epidural catheters,
6. checking vital parameters in PACU
7. Setting up for cvp/ibp monitoring Checking of double lumen tubes
8. Defibrillator-charging and method of defibrillation Care of ICD tube Bed side lung function tests
9. Method of insertion of ICD Lithotomy position Insertion of ryles tube
10. Preparation for anaesthesia in MRI
11. Tourniquet application
12. Position for tonsillectomy

CUTM1837 - Project

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Project	**CUTM1837**	Project	0-0-12	Basic Medical science

CUTM1838- Internship

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Internship	**CUTM1838**	Project	0-0-12	Basic Medical Science

Internship Thesis Guideline

This Guideline is designed to provide students the knowledge and practice of public health research activity, to enable them to carry out researches and solve research related problems and to help them in writing thesis and defend their work. Upon successful completion of the course, the students shall be able to:

1. Search relevant scientific literature
2. Develop a research proposal
3. Employ appropriate data collection techniques and tools
4. Manage collected data
5. Analyze data with appropriate statistical techniques
6. Write thesis
7. Defend the findings

Proposal Development: At the ending of third year (Sixth Semester), students individually consultation with designated faculties and extensive literature survey will develop research proposal during the initial 6 months period.

Data Collection/ Thesis Writing:

Students will carry out data collection, data management, data analysis, and thesis writing during theremaining period (Six Semester).

The Dissertation should have following format:

1. Title
2. Introduction
3. Materials and Methods
4. Results
5. Discussion
6. Conclusion
7. Recommendation
8. References
9. Appendix

Internship

1. Case record
2. Lab management and ethics
3. Evaluation -Guide(internal)
4. -Industries guide(external)
5. -University-project report/ Viva