CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT,ODISHA

SCHOOL OF PARAMEDICS & ALLIED HEALTH SCIENCES

Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

BACHELORE OF SCIENCE IN OPERATION THERATER TECHNOLOGY

2021

SYLLABUS

BACHELOR OF SCIENCE IN OPERATION THEATRE TECHNOLOGY

Programme structure

BASKET 1	BASKET 2	BASKET 3	BASKET 4	TOTAL CREDITS
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 DC-22	AECC-I AECC-II	SFS-1 SFS-2 SFS-3 SFS-4 SFS-5	
18 Credits	**96 Credits**	**6 Credits**	**20 Credits**	**140 Credits (Minimum Credits required)**

BACHELOR OF SCIENCE IN OPERATION THEATRE TECHNOLOGY

BASKET I
School Core Courses

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 (Discipline Core Courses)

CODE	SUBJECT	SUBJECT TYPE (T+P+Pj)	CREDITS
CUTM1839	Medical Terminology and Record keeping	2+0+1	3
CUTM1742	Basic computer and Information Science	0+2+0	2
CUTM1734	Medical Law and Ethics	2+0+1	3
CUTM1753	Introduction to Quality and Patient safety	3+0+2	5
CUTM1840	Practical orientation on Community and Health care sector industry	2+0+1	3
CUTM1813	Pharmacology	3+0+1	4
CUTM1733	Microbiology`	3+2+0	5
CUTM1818	Basic principles of Hospital Management	3+0+1	4
CUTM1845	Clinical practices in hospital for OTT- I	0+4+0	4
CUTM1862	Hospital & Clinical Pharmacy	3+2+0	5
CUTM1816	Introduction to Anesthesia and OT Technology	3+0+1	4
CUTM1822	Anesthesia Techniques Including Complication	3+0+1	4
CUTM1846	Clinical practices in hospital for OTT- II	0+4+0	4
CUTM1841	Basics of Surgical procedures	2+1+0	3
CUTM1814	Basics in Medical Physics & Electronics	3+0+1	4
CUTM1842	CSSD Procedures	2+1+0	3
CUTM1847	Clinical practices in hospital for OTT- III	0+4+0	4
CUTM1843	Advance surgical techniques	2+1+0	3

CUTM1844	Basic Intensive care	2+1+0	3
CUTM1848	Clinical practices in hospital for OTT- IV	0+4+0	4
CUTM1849	OTT Project		12
CUTM1850	OTT Internship		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

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)

CUTM1843-Advance Surgical Techniques

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Advance Surgical Techniques	CUTM1843	Theory+ Project	2-1-0	General MedicalScience

Course Objective:

- Cardiovascular and Respiratory System- Techniques, equipment, procedures and instruments.
- Techniques of Perfusion and operational capabilities.
- Monitoring Techniques and Equipment.
- Management of emergency surgeries**.**
- Positioning of patient for different operations.

Course Outcomes:

- Introduction to Diseases of cardiovascular and respiratory systems- Techniques, equipment, procedures and instruments.
- They will get knowledge about Techniques of Perfusion and operational capabilities
- Care of unconscious adult and pediatric patients.
- They will learn about different monitoring techniques and also monitoring devices.
- Students will learn about Basic nursing and different techniques.
- Students will learn about the Positioning of patient for different operations: Problems and hazards.
- They will learn about the management of different emergency related to surgery and anaesthesia.

Course Outline

1. Cardiovascular and Respiratory System- Techniques, equipment, procedures and instruments
   a) Diseases of cardiovascular and respiratory systems.
   b) Types of perfusion machines.
   c) Techniques of Perfusion and operational capabilities.
   d) Intra-aortic Balloon pump.
   e) Cell saver techniques.
   f) Care, maintenance and working of Heart lung Machine.
   g) Patient's record keeping preoperatively, during anesthesia and post-operatively.
   h) Principles and techniques of temperature monitoring.
   i) Positioning during cardiothoracic surgical procedures.

j) Positioning and techniques for:Radial artery cannulation. Central venous cannulation / pulmonary artery catheter. Femoral artery/venous cannulation.

2. Monitoring Techniques and Equipment:
   a) Cardiac monitors, blood pressure and ECG monitoring.
   b) Respiratory monitors, respiratory rate, Spirometers, SpO2, and EtCO2.
   c) Temperature monitors.
   d) TEE and echocardiography machine
   e) Non- invasive cardiac output machine
3. Positioning-
   a) During various neurosurgical procedures including sitting, prone, lateral and position for trans-sphenoidal hypo-physectomy.
   b) Fixation of head during various neurosurgical procedures.
   c) Prone and Knee chest position for spine surgery.
4. Requirements during intubation in a case of cervical spine fracture including fiber- optic laryngoscopy, awake intubation, LMA family especially ILMA.
5. Anaesthetic and surgical requirements during aneurysm surgery.
6. Surgical and Anaesthetic requirements during micro neurosurgery including types of microscopes, principle, structural features, microscopic photography and cameras used.
7. Anaesthetic and surgical requirements during thyroid surgery, adrenal surgery.
8. Anaesthetic and surgical requirements during abdominal surgery including Laproscopic surgery, genitourinary surgery including percutaneous nephrolithotomy, Endoscopic surgery, TURP, TURBT, Lithotripsy, ESWL (Extracorporeal shock wave therapy)
9. Anaesthetic and surgical requirement during renal transplant donor and recipient surgery including care and precautions during operative procedures of hepatitis B & hepatitis C positive patients.
10. Anaesthetic and surgical requirement during pediatric and Neonatal surgical procedures including emergency procedures like tracheo-esophageal fistula. Sub diaphragmatic hernia, major abdominal and thoracic procedures. Foreign body bronchus and esophagus.
11. Apparatus and techniques for measuring blood pressure and temperature.
12. Principle and working of direct/Indirect blood pressure monitoring apparatus.
13. Intraoperative and postoperative problems and complications of general surgery.
14. Management of emergency caesarean section.
15. Management of massive obstetrical hemorrhage.
16. Surgical management in major burns and craniofacial surgery.
17. Surgical management of joint replacement and arthroscopy.
18. Surgical management of endoscopies, laryngectomy with RND and cochlear implant.
19. Management of PPV and perforating eye injury.
20. Care and maintenance of Para-surgical equipment (Cautery, OT Lights, OT Table etc.)

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:

- 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 era,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 gasflow,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 Reessystem 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,Hazardsof 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

a) Text books: Recent edition
b) The Anaesthesia Technician and Technologists Manual by Ahanatha Pillai
c) Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition
d) 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

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:

- To understand the required set up at Anaesthesia work space
- To learn about handling of major catastrophes

Course outcome:

- The student will be able to set up the anaesthesia work area
- The candidate will be able to handle intra operative conditions
- The candidate will be able to provide patient care in ICU

Course Outline

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:

Davidson's Principles and Practice of Medicine - Elsevier Publications Harrison's Principle of InternalMedicine

CUTM1818-Basic Principles of Hospital Management

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basic Principles of Hospital Management	CUTM1818	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- To be recognised nationally and internationally as a leader in improving medication outcomes and pharmacy practice research and education.
- To establish relationships with key individuals and organisations to improve the quality use of medicines and health outcomes.

Course Outcomes:

- Know various drug distribution methods
- Know the professional practice management skills in hospital pharmacies.
- Provide unbiased drug information to the doctors.

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

infrastructurefacilities, 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 specialreference 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

1. Health Programmes:
    - Family Welfare Programme
    - National Programme for water supply and sanitation.
    - Nutritional Programmes.
    - Immunization and universal immunization programme.
2. Disease Eradication programme: Leprosy & Guinea worm, polimyclitis.
3. 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.

CUTM1841-Basics of Surgical procedures

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basics of Surgical procedures	CUTM1841	Theory+ Practice	2-1-0	Fundamental Science

Course Objective

- To learn about the concept of blood transfusion
- To learn the handling of para surgical equipment's

Course outcome:

- The student will be able to handle the cases requiring blood transfusion
- The student will gain an understanding of surgical procedures
- The student will learn to handle surgical equipments

Course Outline

1. Blood Transfusion
   a) History of discovery of blood groups and genetics of blood groups.
   b) Types of blood groups and Rh factor.
   c) Coombs test.
   d) Collection of blood, its preservation and standardization.
   e) Various types of blood and blood products (Packed cells, PRP,FFP)
   f) Pre-transfusion checks.
   g) Transfusion reactions.
   h) Fluids and electrolytes
   i) Body fluid compartments and the effect of fluid administration on them.
   j) Types of fluids (crystalloids and colloids) and their chemical composition.
   k) Indications of specific fluids and their complications.
2. General surgical procedure and para-surgical equipment
   a) Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system.
   b) Different types of diathermy machine. Monopole, Bipolar, Ligasure, HarmonicScalpel, CUSA- Principle, hazards, prevention, functioning and maintenance.

c) Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance.
d) Operation Theatre sterilization- Different recent advances.
e) LAR/APR--Positioning of patient, care-Prevention of hazards.
f) Total thyroid ectomy—with emphasis on proper positioning.
g) Transthoracic esophagectomy—Different approaches.
h) Venesection and Tracheostomy.
i) Laparoscopic Cholecystectomy– Pneumo-peritoneum- Creation and emoving, principles.
j) Nephrectomy.
k) Breastsurgery.
l) Positioning of patient for different operations: Problems and hazards.
m) Hypothermia and hyperthermia.

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).

CUTM1844-Basic Intensive care

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Basic Intensive care	CUTM1844	Theory+Practice	2-1-0	Fundamentals of Computer

Course Objective:

- Introduction to ventilators, suction machine, monitoring devices.
- Operational capabilities of beds, lights and other apparatus.
- Patient care.
- Psychological aspects of the patient, relative and staff.
- Positioning of patient for different operations: Problems and hazards.

Course Outcomes:

- Introduction to ventilators, suction machine, monitoring devices and all other equipments.
- They will get knowledge about Oxygen therapy, maintenance of clear Airway equipment.
- Care of unconscious adult and pediatric patients.
- Physiotherapy techniques, feeding, Ryle's tube insertion and hyper alimentation
- Students will learn about Basic nursing and different techniques.
- Students will learn about the Positioning of patient for different operations: Problems and hazards.
- Apparatus and techniques of measuring of blood pressure and temperature; Principle and working of direct/indirect blood pressure monitoring apparatus; structure, principle and working of the oscillotonometer. Principles and working of aneroid manometer type B.P. instrument.

1. Care and maintenance of ventilators, suction machine, monitoring devices.
2. Sterilization and disinfection of ventilators.
3. Care, maintenance and operational capabilities of beds, lights and other apparatus.
4. Air conditioning and control of pollution in ICU.
5. Attachment and intra operative utility of ventilators and monitoring devices.
6. Care of unconscious adult and pediatric patients.
7. Physiotherapy techniques, feeding, Ryle's tube insertion and hyper alimentation.
8. Suctioning and posturing of semiconscious and unconscious patients.
9. Oxygen therapy, maintenance of clear Airway.

10. Ventilation of patient in crisis:
11. Mouth to mouth.
12. Mouth to ET Tube.
13. Resuscitator/ bag valve mask assembly
14. Different types of Airways.
15. Short term ventilation/ Transport ventilators.
16. ICU Laboratory; Detection of blood gases of the patient, Principles of ABG machines.
17. Management of asepsis.
18. Management of tetanus patient.
19. Psychological aspects of the patient, relative and staff.
20. Hemofiltration and hemodialysis.
21. Ventilators: Principles of working of different ventilators:
    a) Volume cycled/Time cycled/Pressure cycled ventilators.
    b) High frequency ventilators and othertypes.
    c) Methods of measuring the expired gases from the patient; Types of spirometers, Principles of working of spirometers. Clinical application ofabove apparatus.
    d) Apparatus and techniques of measuring of blood pressure and temperature; Principle and working of direct/indirect blood pressure monitoring apparatus; structure, principle and working of the oscillotonometer. Principles and working of aneroid manometer type
    e) B.P. instrument.
    f) Laryngeal sprays; Types, material, principle and mechanism.
    g) Monitoring techniques and equipment; Cardiac monitors, Respiratory monitors, Spirometers, Temperature monitors.

CUTM1842-CSSD Procedures

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
CSSD Procedures	CUTM1842	Theory+ Practice	2-1-0	Fundamental Science

Course Objective:

- Principles of sterilization and disinfection.
- Prevention of hazards of sterilization
- Precautions to be taken during sterilization
- Recent advances in the methods of sterilization

Course Outcomes:

- Students will able to get knowledge about sterilization and disinfection.
- The student will also be briefed regarding hazards of sterilization.
- They will get to know about the Precautions to be taken during sterilization

Course Outline

1. Principles of sterilization and disinfection
2. Methods of sterilization
3. Dry Sterilization
4. Wet Sterilization
5. Gaseous sterilization
6. Chemical sterilization
7. Sterilization by radiation (Gamma rays, ultraviolet rays)
8. Techniques of sterilization of rubber articles. (LMA, FOB, ETT, Laryngoscopes,Anesthesia machines and circuits.)
9. Technique of sterilization of carbonized articles
10. Methods of disinfection
11. Boiling
12. Chemical disinfection
13. Hazards of sterilization
14. Prevention of hazards of sterilization
15. Precautions to be taken during sterilization
16. Recent advances in the methods of sterilization

CUTM1845-Clinical practices in hospital for OTT- I

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Clinical practices in hospital for OTT- I	CUTM1845	Practice	0-4-0	Fundamental Science

Course Objective:

- To understand the basics of preparation of OT
- To understand the management of an OT

Course outcome:

- The student will get the basic understanding of operation techniques
- The student will learn about the multidisciplinary team work within an OT set up
- The student will learn about the maintenance of an OT

Students will observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients. The student will be introduced to terminologies, equipment, and techniques used for preparation and management of the OT.

CUTM1846-Clinical practices in hospital for OTT- II

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Clinical practices in hospital for OTT- II	CUTM1846	Practice	0-4-0	Fundamental Science

Course Objective

- To understand about the clinical preparations within an OT
- To understand the management of an OT

Course outcome

- The student will get a clinical exposure of operation techniques
- The student will learn to be a part of a team to work within an OT set up
- The student will learn about interaction with patients

Students will gain additional skills in clinical preparation, interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experience under the supervision of a senior technical officer.

CUTM1847-Clinical practices in hospital for OTT- III

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Clinical practices in hospital for OTT- III	CUTM1847	Practice	0-4-0	Fundamental Science

Course Objective:

- To understand about the clinical preparations within an OT
- To conceptualize problem solving attitude within an OT

Course outcome:

- The student will develop competence in working in OT set up
- The student will learn about handling of equipments in OT
- The student will learn about interaction with patients

Students will improve their skills in clinical procedures. Progressive interaction with patients and professional personnel are monitored as students practice in a supervised setting. Additional areas include problem solving, identifying machine components and basic side effect management.Students will demonstrate competence in beginning, intermediate, and advanced procedures.

CUTM1848-Clinical practices in hospital for OTT- IV

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Clinical practices in hospital for OTT- IV	CUTM1848	Practice	0-4-0	Fundamental Science

Course Objective:

- To develop skills to work in an OT set up
- To conceptualize problem solving attitude within an OT

Course outcome:

- The student will gain confidence in working in an OT set up
- The student will develop competence in working in OT set up
- The student will learn about handling of equipments in OT

The course provides students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures.

CUTM1753- Introduction to Quality and Patient Safety

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Introduction to Quality and Patient Safety	CUTM1753	Theory+ Project	3-0-2	Fundamental Science

Course Objective

- Knowing patient safety
- Report Distribution system
- Laboratory infection control Policy
- Bio-Medical waste management
- Understanding Patient rights
- ISO Policy for medical laboratory

Course outcome

- Know about rights and duties of patient
- Know about right and duties of lab technician
- Understand various policy to manage lab
- Understand infection control procedure

Course Outline

Module I

Human factor Engineering, Patient safety, Health literacy, Report distribution system,Error in reporting system, responding to adverse events, Investigation of error/ Root cause analysis, Medical Error, The science of safety

Practice: Safety precaution in laboratory, Report distribution, Prescription reading

Module-II (11 Hrs)

Team work and communication, Leadership, Quality control policy, Major development and evaluation in diagnostic division, Clinical establishment act policy, National accreditation board of laboratory, ISO Policy for medical laboratory, Fire and safety policy for medical laboratory

Practice: Fire Safety in lab, Documentation for Lab establishment

Module-III (13 Hrs)

Personal protective equipment in the laboratory, AIDS and laboratory safety, Safety protection in lab in STD and other infectious disease., Biomedical waste management, Patient care in medical

laboratory, Patient rights., Counselling of patient during phlebotomy, First aid in medical laboratory service.
Practice: PPE, Bio-Medical waste management, First-Aid, Patient Counseling

Suggested Readings:

1. Understanding the patient safety (LANGE clinical medicine)
2. Textbook of Clinical laboratory methods and diagnosis by Gradwohls, Publisher Mosby
3. Medical laboratory technology Vol.1 by K. L. Mukherjee, 2007, Publisher TataMcGrawHill
4. Textbook of medical laboratory technology by Praful B Godkar, Publisher Bhalan
5. Medical laboratory science theory and practice by J Ochei and Kolhatkar, 2002, TataMcGraw- Hill, Publisher TBS

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

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

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

CUTM1839-Medical Terminology and Record keeping

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Medical Terminologyand Record keeping	CUTM1839	Theory+Project	2-0-1	Fundamentals of Computer

This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests

Course Objective:

- To learn the commonly used terms used in medical field
- To learn the technique of record maintenance in medical field

Course Outcome:

- The student will be able to understand the terminologies used in medical field
- The candidate will be able to maintain medical records
- The candidate will develop the potential for electronic data entry and maintenance

Course Outline

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.
4. Basic medical terms.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.
7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
8. Interpret medicalorders/reports.
9. Data entry and management on electronic health record system.

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.*

CUTM1840-Practical orientation on Community and Health care sector industry

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Practical orientation on Community and Health care sector industry	CUTM1840	Theory+ Project	3-0-1	Fundamental Science

Course Objective:

- To learn about the chains of healthcare delivery system
- To learn about the governance of medical care at village area.

Course outcome:

- The student will develop competence in working in OT set up
- The student will learn about handling of equipments in OT
- The student will learn about interaction with patients

The objective of this particular section of the foundation course is to sensitize potential learners with essential knowledge; this will lay a sound foundation for their learning across the under-graduate program and across their career. Innovative teaching methods should be used to ensure the attention of a student and make them more receptive such as group activities, interactive fora,role plays, and clinical bed-side demonstrations.30

1. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -Sub center, PHC, CHC, SDH, DH and Medical college, private hospitals, dispensaries and clinics.
2. The student will also be briefed regarding governance at village level including interactionand group discussion with village panchayat and front line health workers.
3. Clinical visit to their respective professional department within the hospital.
4. Visit to Health care sector institutions (Tertiary hospitals of Govt. and corporate)

CUTM1862-Hospital & Clinical Pharmacy

Subject Code	Name of the Subject	Subject Type (T - Pr -Pj)	No. OfCredits
CUTM1862	Hospital & Clinical Pharmacy	3-2-0	5

Course Objective

To be recognized nationally and internationally as a leader in improving medication outcomes and pharmacy practice research and education. To establish relationships with key individuals and organizations to improve the quality use of medicines and health outcomes.

Course outcome

Hospital Pharmacy

1. Know various drug distribution methods
2. Know the professional practice management skills in hospital pharmacies.
3. Provide unbiased drug information to the doctors.

Clinical Pharmacy

1. Interpret evidence and patient data.
2. Implement and/or recommend patient care plans.
3. Monitor the patient and adjust the care plan as needed.

Course Outline:

Module I

Hospital and it's organization Definition, Classification of hospital- Primary, Secondary and Tertiary hospitals. Classification based on clinical and non- clinical basis, Organization Structure of a Hospital, and Medical staffs involved in the hospital and their functions. Hospital pharmacy and its organization Definition, functions of hospital pharmacy Organization structure Location, Layout and staff requirements, and Responsibilities and functions of hospital pharmacists. Adverse drug reaction Classifications - Excessive pharmacological effects, secondary pharmacological effects, idiosyncrasy Allergic drug reactions, genetically determined toxicity, toxicity following sudden withdrawal of drugs Drug interaction- beneficial interactions, adverse

interactions, and pharmacokinetic drug interactions Methods for detecting 149 drug interactions spontaneous case reports and record linkage studies Adverse drug reaction reporting and management. Community Pharmacy Organization and structure of retail and wholesale drug store, types and design Legal requirements for establishment and maintenance of a drug store, Dispensing of proprietary products Maintenance of records of retail and wholesale drug store.

Module II

Drug distribution system in a hospital Dispensing of drugs to inpatients, types of drug distribution systems Charging policy and labelling, Dispensing of drugs to ambulatory patients, and Dispensing of controlled drugs. Hospital formulary Definition, contents of hospital formulary Differentiation of hospital formulary and Drug list Preparation and revision, and addition and deletion of drug from hospital formulary. Therapeutic drug monitoring Need for Therapeutic Drug Monitoring, Factors to be considered during the Therapeutic Drug Monitoring Indian scenario for Therapeutic Drug Monitoring. Medication adherence Causes of medication non-adherence, pharmacist role in the medication adherence, and monitoring of patient medication adherence. Patient medication history interview Need for the patient medication history interview, medication interview forms. Community pharmacy management Financial, materials, staff, and infrastructure requirements.

Module III

Pharmacy and therapeutic committee Organization, functions, Policies of the pharmacy Therapeutic committee in including drugs into formulary, inpatient and outpatient prescription, automatic stop order, and emergency drug list preparation. Drug information services 150 Drug and Poison information Centre, Sources of drug information, Computerized services, and storage and retrieval of information. Patient counseling Definition of patient counseling; steps involved in patient counseling, and Special cases that require the pharmacist Education and training program in the hospital Role of pharmacist in the education and training program Internal and external training program, Services to the nursing homes/clinics Code of ethics for community pharmacy Role of pharmacist in the interdepartmental communication and community health education. Prescribed medication order and communication skills Prescribed

medication order- interpretation and legal requirements Communication skills- communication with prescribers and patients.

Module IV

Budget preparation and implementation Budget preparation and implementation Clinical Pharmacy Introduction to Clinical Pharmacy, Concept of clinical pharmacy. Functions and responsibilities of clinical pharmacist, Drug therapy monitoring - medication chart review Clinical review, pharmacist intervention, Ward round participation Medication history and Pharmaceutical care. Dosing pattern and drug therapy based on Pharmacokinetic & disease pattern. Over the counter (OTC) sales Introduction and sale of over the counter, and Rational use of common over the counter medications.

Module V

Drug store management and inventory control Organisation of drug store, types of materials stocked and storage conditions Purchase and inventory control: principles, purchase procedure, purchase order, procurement and stocking, Economic order quantity Reorder quantity level, and Methods used for the analysis of the drug expenditure Investigational use of drugs 151 Description, principals involved, classification Investigational use of drugs control, identification, Role of hospital pharmacist, advisory committee. Interpretation of Clinical Laboratory Tests Blood chemistry, hematology, and urinalysis

Books Recommended

1. Remington's pharmaceutical sciences.
2. Testing of raw materials used in (1)
3. Evaluation of surgical dressings.
4. Sterilization of surgical instruments, glassware and other hospital supplies.
5. Handling and use of data processing equipments.

1. .

CUTM1849 - Project

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Project	**CUTM1849**	Project	0-0-12	Basic Medical science

CUTM1850 - Internship

Subject Name	Code	Type of course	T-P-Pj	Prerequisite
Internship	**CUTM1850**	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