FACULTY OF ALLIED HEALTH SCIENCES

SYLLABUS

FOR

M.Sc. MEDICAL TECHNOLOGY (ANESTHESIA & OPERATION THEATRE TECHNOLOGY) (SEMESTER I-IV)

(Under Choice based Credit System)

Examinations: 2021 Onwards

Department of Allied Health Sciences

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Note:

(i) Subject to change in the syllabi at any time. Please visit the University website time to time.

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and

To prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

- To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;
- To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;
- To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;
- To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking

of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

- To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;
- To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;
- To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;
- To anticipate the global technological needs and to plan and prepare to cater to them;
- To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and
- To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

Department of Allied Health Sciences

VISION

- To impart knowledge of health & medical education & help in making India a centre of Medical Education & Health Care.
- To establish & develop world class self-reliant institute for imparting Medical and other Health Science education at under-graduate & post-graduate levels of the global competence.
- To serve & educate the public, establish guidelines & treatment protocols to be followed by professionals while treating in hospitals.
- To develop and provide professionally qualified health workers for augmenting the nation's human resources through Bio-Medico-Socio-epidemiological scientific research.

MISSION

- To strive incessantly to achieve the goals of the Institution.
- To impart academic excellence in Allied Health Education.
- To practice medicine ethically in line with the global standard protocols.
- Having a revolutionary impact on students by focusing on deep inter-disciplinary knowledge, getting technical as well as Theoretical concept of Health Sciences, focusing on leadership, communication and interpersonal skills, personal health and well-being.
- Creating best of educational experience by engaging with partners outside the traditional borders of University campus. By engaging in a network of Hospitals & other Healthcare providing facilities to create a job oriented
- Cultivating productive community by attracting and retaining diverse, best talent and such an environment where research, innovation, creativity and entrepreneurship can flourish.
- To give students the best knowledge by the most innovative methods and also provide hospital exposure to work in different fields of Paramedical Sciences.
- To create a well-qualified and highly trained world class Technicians & Assistants who will aid in delivering high-class care & helping in betterment of mankind.

TITLE OF THE PROGRAM: M.Sc. MEDICAL TECHNOLOGY (Anesthesia & Operation Theatre Technology)

YEAR OF IMPLIMENTATION: New Syllabus will be implemented from July 2021 onwards.

DURATION: The course shall be two years, with semester system (4 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for reserved categories) in Bachelors Degree in Anaesthesia & Operation Theatre Technology are eligible for admission to this course.

INTAKE CAPACITY: 30 (Thirty)

MEDIUM OF INSTRUCTION: English.

PROGRAM EDUCATIONAL OBJECTIVES:

The Program Educational Objectives are the knowledge skills and attitudes which the students will acquire during post-graduation.

PEO1	Those who choose this stream are going to study about Anaesthesia & Surgical Equipments, Critical Care, Pain Management etc.
PEO2	Ability to analyse, Monitor & give care to a Surgical/Anaesthetized patient.
PEO3	Understand the fundamentals and applications of Anaesthesia, Surgical & Critical Care Equipments.
PEO4	Ability to Assist an Anaesthesiologist through General or Regional Anaesthesia.
PEO5	Ability to have knowledge of BLS & ACLS and ability to deliver it whenever required.
PEO6	Able to detect any Changes in patient's physiological status & able to tackle all types of Complications.
PEO7	Learn and Understand different Anesthetic & Surgical Procedures & their benefits as well as complications.
PEO8	Ability to Assist the Surgeon throughout Surgery & other important procedures.

PROGRAM OUTCOMES: At the end of the program, the student will be able to:

PO1	Have a lifelong knowledge of Anaesthesia, Surgery & all the Equipments used in it along with basic knowledge of applied science.
PO2	Anaesthesia & Surgical Technicians/Assistants will work in Operation Theatres, ICUs etc. along with Anesthetists and Surgeons & thus will be having a great & Important role in Healthcare.
PO3	After completion students can go for Academics as well by joining different Colleges and Universities as Lecturers/Tutors.
PO4	This Program will build technical knowledge in the student so that he/she will be able to assist an Anesthetist/Surgeon in every aspect of Anaesthesia, Surgery & other related fields.
PO5	Engage in lifelong learning and adapt to changing professional and societal needs.
PO6	This Program can do an overall development of the student to be able to have all the technical aspects about Anaesthesia, Surgery along with their advanced knowledge.

PROGRAM SPECIFIC OUTCOMES:

At the end of the program,

PSO1	Students will be competent to work in Hospital Operation Theatres, Critical Care Units and Emergency sections.
PSO2	Students will be skilled in problem solving, critical thinking and will be able to assist the Surgeon or Anesthetist.
PSO3	The students will acquire in-depth knowledge of Anesthesia, Surgery, Critical care and pain Management.
PSO4	Students will be able to have all the relevant knowledge of Anesthesia & Surgery and will be able to do various procedures required.
PSO5	This Program will create a great source of manpower which can aid in our health sector especially in Trauma, Emergency, ICU & Operation Theatres.
PSO6	Students will be able to explore new areas of research in both Anesthesia & Surgery and can also go for research as well.
PSO7	Students will be able to integrate knowledge of various types of Surgical Procedures & Anesthetic procedures along with their in-depth knowledge.

SCHEME OF THE PROGRAM:

Semester-I								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 101-21	PRINCIPLES OF ANESTHESIA TECHNOLOGY	45	4-0-0	4	30	70	100
2.	MAOTT 102-21	SURGICAL EQUIPMENTS & TECHNOLOGY	45	4-0-0	4	30	70	100
3.	MAOTT 103-21	APPLIED ANATOMY & PHYSIOLOGY	45	4-0-0	4	30	70	100
4.	MAOTT 104-21	FUNDAMENTAL OPERATION THEATRE SKILLS	45	4-0-0	4	30	70	100
5	MAOTT 105-21	GENERAL PRINCIPLES OF HOSPITAL PRACTICES	35	3-0-0	3	30	70	100
6.	MAOTT 106-21	APPLIED ANATOMY & PHYSIOLOGY LAB	30	0-0-3	2	50	25	75
7.	MAOTT 107-21	PRINCIPLES OF ANESTHESIA TECHNOLOGY LAB	30	0-0-3	2	50	25	75
8.	MAOTT 108-21	SURGICAL EQUIPMENTS & TECHNOLOGY LAB	30	0-0-3	2	50	25	75
		Total	**25 (Theory 19, Practical 6)**			**300**	**425**	**725**

Semester-II								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 201-21	ANESTHESIA EQUIPMENTS & TECHNOLOGY	45	4-0-0	4	30	70	100
2.	MAOTT 202-21	SURGICAL TOOLS & TECHNIQUES	45	4-0-0	4	30	70	100
3.	MAOTT 203-21	SURGICAL PROCEDURES	45	4-0-0	4	30	70	100
4.	MAOTT 204-21	SURGICAL INSTRUMENTS & TRAYS	45	4-0-0	4	30	70	100
5.	MAOTT 205-21	ANESTHESIA EQUIPMENTS & TECHNOLOGY LAB	30	0-0-3	2	50	25	75
6.	MAOTT 206-21	SURGICAL TOOLS & TECHNIQUES LAB	30	0-0-3	2	50	25	75
7.	MAOTT 207-21	SURGICAL PROCEDURES LAB	30	0-0-3	2	50	25	75
8.	MAOTT 208-21	SURGICAL INSTRUMENTS & TRAYS LAB	30	0-0-3	2	50	25	75
		Total	**24 (Theory 16, Practical 8)**			**320**	**380**	**700**

Semester-III								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 301-21	ANESTHESIA FOR SPECIAL SURGERIES	45	4-0-0	4	30	70	100
2.	MAOTT 302-21	INTENSIVE CARE UNIT	45	4-0-0	4	30	70	100
3.	MAOTT 303-21	ADVANCED SURGICAL TECHNIQUES	45	4-0-0	4	30	70	100
4.	MAOTT 304-21	APPLIED PHARMACOLOGY FOR ANESTHESIA	45	4-0-0	4	30	70	100
5	MAOTT 305-21	ANESTHESIA FOR SPECIAL SURGERIES LAB	30	0-0-3	2	50	25	75
6.	MAOTT 306-21	INTENSIVE CARE UNIT LAB	30	0-0-3	2	50	25	75
7.	MAOTT 307-21	ADVANCED SURGICAL TECHNIQUES LAB	30	0-0-3	2	50	25	75
+		**Total**	**22 (Theory 16, Practical 6)**			**270**	**355**	**625**

Semester-IV								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Thesis	Viva	
1.		INTERNSHIP*	6 Month	0-0-30	15	-	-	-
2.		DISSERTATION/THESIS SUBMISSION**		-	-	50	50	100
		Total	**15 (Theory 0, Practical 15)**					**100**

** Dissertation work will be held in fourth semester. In fourth semester, students will go to Hospitals for Internship and along with that, they will prepare their respective thesis and submit it after completing their Internship. There will be a Presentation/Viva before a panel of teachers from the department after submission of thesis.

EXAMINATION AND EVALUATION

THEORY				
S.No.		Weightage in Marks		Remarks
1	Mid-Semester Examination	20	15	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Average of two mid-semester exams will be considered for evaluation
2	Attendance	5	5	
3	Assignments	5	5	
4	End-Semester Examination	70	50	Conduct and checking of the answer sheets will be at the department level in case of university teaching department of Autonomous institutions. For affiliated colleges examination will be conducted at the university level
	Total	**100**	**75**	
PRACTICAL				
1	Daily evaluation of practical performance/ record/ viva voce	30		Internal Evaluation
2	Attendance	5		
3	Internal Practical Examination	15		
4	Final Practical Examination	25		External Evaluation
	Total	**75**		

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-j)] covering whole syllabus. There will be no choice in this question. It will be of 20 marks comprising of **10 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 30 marks with **6 questions of 5 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

SEMESTER-I

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 101-21**			
Subject Title:	**PRINCIPLES OF ANESTHESIA TECHNOLOGY**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about introduction of basic anesthetic instruments & anesthetic procedures.			

Details of the Course

Unit	Contents	Contact Hours
I	Principle of anesthesia; Triad of Anesthesia History of Anesthesia. Stages of Anesthesia. Classification of anesthesia Pre-anesthetic check-up of patient, Premedication. Care and preparation of patient in pre-operative ward; Preparation of patient for operation theatre; Management of O.T. before operation. Care and monitoring of patient in post-operative ward.	12
II	**Medical Gas:** Introduction to Gas Cylinders, Color coding, Cylinder valves, Cylinder storage, index safety system. Medical gas pipeline system, Alarms and safety devices. Simple oxygen administration devices Face mask, venturi mask and LMA, Flow meters, Regulators. Oral and Nasal endotracheal tubes. Tracheotomy tubes. Airway its features, Types, sizes, Indications and its complication. **Oxygen Therapy:** Definition, hypoxemia, Causes and clinical signs of hypoxemia. Goals of oxygen therapy, Hazards of oxygen therapy.	12

III	Laryngoscopy & Types of Laryngoscope, Intubation: Oral intubation, Nasal intubation. Spinal/Lumber anesthesia. General Anesthesia. **Breathing System:** Introduction to breathing system Mapleson breathing system Jackson Rees system Bain circuit, Non breathing valves – Ambu valves. **Gas Analyzers:** Pulse Oximeter. CO2 Monitor. Capnography.	11
IV	Methods of cleaning and sterilization of anesthetic equipment's. Pipeline system of anesthetic gases; Central pipeline system; compressed gases; Pressure indicators and Alarms; bulk gas cylinders. Multiparameter Monitors, Types of monitoring; Commonly used I.V. fluids; Central nervous system monitoring; Neuromuscular monitoring, Blood loss monitoring.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Pre-Anaesthetic Checkup or Assessment & Premedication.
CO2. Study about history, Components & Types of Anaesthesia.
CO3. Understanding about various Equipments used in Anaesthesia.
CO4. Know about Boyle's Anaesthesia Machine & Medical gas Cylinders.
CO5. Study about Suction Apparatus, AMBU, Laryngoscope, Endotracheal Tube & other Equipments.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	Arun Kumar Paul	Drugs & Equipments in Anaesthetic Practice	Elsevier
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 107-21**			
Subject Title:	**PRINCIPLES OF ANESTHESIA TECHNOLOGY LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about introduction of basic anesthetic instruments & anesthetic procedures.			

Details of the Course

Unit	Contents
I	1) History of anesthesia. 2) Physics in principles of Anaesthesia machine 3) Boyle's machine in details. 4) Anaesthesia gases, 5) Cylinders & Central Pipeline 6) Vaporizers,
II	**1.** Anaesthetic flow meter, **2.** Different types of Endotracheal tubes and Endo-bronchial tubes. **3.** Breathing circuits, **4.** General anaesthesia. **5.** Monitoring in anaesthesia.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Pre-Anaesthetic Checkup or Assessment & Premedication.
CO2. Study about history, Components & Types of Anaesthesia.
CO3. Understanding about various Equipments used in Anaesthesia.
CO4. Know about Boyle's Anaesthesia Machine & Medical gas Cylinders.
CO5. Study about Suction Apparatus, AMBU, Laryngoscope, Endotracheal Tube & other Equipments.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	Arun Kumar Paul	Drugs & Equipments in Anaesthetic Practice	Elsevier
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 102-21**			
Subject Title:	**SURGICAL EQUIPMENTS & TECHNOLOGY**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about introduction of basic Surgical instruments & procedures.			

Details of the Course

Unit	Contents	Contact Hours
I	Role and responsibilities of an OT technician. Rules and regulations in operation theatre. Ethics of an OT technician, Carrier path of an OT technician. Biomedical waste management, Personal protective equipments. Introduction of operation theatre, Pre-operative, Post-operative rooms. Operation theatre complex-layout -location, types, zones, size, Care and maintenance of surgical equipments. Cleaning of O.T. Fumigation of O.T**.** Sterilization: Methods & Types	12
II	Operating table O.T lights Diathermy machine (Electro-cautery) General surgical procedures and instruments. Preparation of operation theatre to receive patient. Care of surgical patients. Transportation of surgical patient, Preparation of surgical instruments trolley. Importance of sterilization &preparation of surgical instruments for sterilization.	12

III	Preparation of laparoscopic instruments. Cleaning and care of laparoscopic instruments. Incision and its types, Major abdominal incision. Cleaning and care of wound. Dressing materials, different types of Dressings. Dressing procedure. Surgical Positioning and its Types , Various types of Suture Materials & types of Suturing. Different types of Drains, Catheters, Drip Sets, Bags.	11
IV	Operating team, operating room staff, Introduction of assisting of surgery, Surgical hand scrubbing, gowning and gloving, Part preparation, drapes and draping. Instruments used for general surgery, Orthopedic surgical instruments, Gynaecology procedure instruments, Minor surgical procedure instruments.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Know About Various Surgical Equipment's used in Operation Theatre.
CO2. To Know About OT Complex Layout.
CO3. Understanding about various Equipments used in different types of Surgeries.
CO4. To know about Surgical Scrubbing and use of PPE's.
CO5. To Know how to prepare OT for surgery & laying Surgical Trolley.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Reference Books

S. No.	Author(s)	Title	Publisher
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 108-21**			
Subject Title:	**SURGICAL EQUIPMENTS & TECHNOLOGY LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about introduction of basic Surgical instruments & procedures.			

Details of the Course

Unit	Contents
I	1. Observation & Demonstration of Preparation of OT for surgery. 2. Preparation of OT Staff. 3. Methods of sterilization in OT- Autoclaving, Fumigation etc. 4. Uses of O.T equipments. 5. Surgical Incision technique.
II	1. Suture materials. 2. Suturing Types- Simple, Mattress, Subcuticular etc. 3. Dressing Procedure. 4. Drain Types & Uses. 5. Handling of Instruments.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Know About Various Surgical Equipment's used in Operation Theatre.
CO2. To Know About OT Complex Layout.
CO3. Understanding about various Equipments used in different types of Surgeries.
CO4. To know about Surgical Scrubbing and use of PPE's.
CO5. To Know how to prepare OT for surgery & laying Surgical Trolley.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Reference Books

S. No.	Author(s)	Title	Publisher
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE
5.	Shenoy Nileshwar	Manipal Manual of Instruments	CBS Publications

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 103-21**			
Subject Title:	**APPLIED ANATOMY & PHYSIOLOGY**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about Anatomy relevant to Operation Theatre.			

Details of the Course

Unit	Contents	Contact Hours
I	Structure and function of the respiratory tract in relation to respiratory system Nose - Role in humidification Pharynx - Obstruction in airways Larynx - Movement or vocal cords, Cord palsies. Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchospasm Alveoli - Layers, Surfactants Respiratory Physiology Control or breathing Respiratory muscles - diaphragm, intercostals	12
II	Lung volumes - dead space, vital capacity, FRC etc. Pulmonary Function Tests. Pleural cavity - intrapleural pressure, pneumothorax. Work of breathing - airway resistance, compliance Respiratory movements under anaesthesia. Tracheal tug - signs, hiccup Pulmonary Gas Exchange and Acid Base Status Pulmonary circulation – Pulmonary oedema, pulmonary hypertension Respiratory Failure & its Types.	12

III	CARDIOVASCULAR SYSTEM Anatomy - Chambers of the heart, major vasculature. Coronary supply Conduction system of Heart. Cardiac output - determinants, heart rate, preload, after load. Coronary blood flow & myocardial oxygen supply ECG – Arrhythmias-Tachycardia and Bradycardia. Hypotension & Hypertension- causes, management. Cardio pulmonary resuscitation. Myocardial infarction. BLS & ACLS.	11
IV	**Nervous system:** Organization of nervous system, Neuron, Neuroglia, Classification and properties of nerve fiber, electrophysiology, Neuromuscular Junction: Action potential, nerve impulse, receptors, synapse, neurotransmitters. Action of Muscle Relaxants on Neuromuscular Junction.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Study the detailed structure of Respiratory system & physiology of all associated structures.

CO2. Study about Respiratory Muscles, Lung volumes & Pulmonary Function Tests.

CO3. Knowledge about Pulmonary conditions & Respiratory Failure.

CO4. Knowledge about Cardiovascular System, Cardiac Conduction & Cardiac Output.

CO5. Study & Knowledge about ECG, CPR & Myocardial Infarction & Neuromuscular Junction.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Reference Books

S. No.	Name of Book	Author (s)	Publisher
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 106-21**			
Subject Title:	**APPLIED ANATOMY & PHYSIOLOGY LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about Anatomy relevant to Operation Theatre.			

Details of the Course

Unit	Contents
I	1. Estimation of blood pressure, 2. Cardiac cycle 3. Respiratory Rate & Lung Volumes 4. Pulmonary Function Tests.
II	1. ECG- Detection of Tachycardia & Bradycardia 2. Myocardial Infarction. 3. Technique of BLS & ACLS. 4. Neuromuscular Junction.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Study the detailed structure of Respiratory system & physiology of all associated structures.

CO2. Study about Respiratory Muscles, Lung volumes & Pulmonary Function Tests.

CO3. Knowledge about Pulmonary conditions & Respiratory Failure.

CO4. Knowledge about Cardiovascular System, Cardiac Conduction & Cardiac Output.

CO5. Study & Knowledge about ECG, CPR & Myocardial Infarction & Neuromuscular

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Reference Books

S. No.	Name of Book	Author (s)	Publisher
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
3	Textbook of Medical Physiology	Guyton & Hall	Elsevier

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 104-21**			
Subject Title:	**FUNDAMENTAL OPERATION THEATRE SKILLS**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about the basic fundamentals of Operation Theatre.			

Details of the Course

Unit	Contents	Contact Hours
I	C.S.S.D. & its Layout. Cleaning and dusting of OT. Methods of cleaning, Composition of dust. General care and testing of instruments : Artery forceps, Hemostatic forceps, Needle holders, Knife, Surgical Blade, Scissor :- use/ abuse, Care of Instruments during surgery.	12
II	Disinfectants and Cleaning of their instruments. Sterilization - Definition, Methods. Cleaning agents- detergents, Mechanical washing, Ultrasonic cleaner, lubrication & inspection. Various methods of chemical treatment - formalin, glutaraldehyde etc, Thermal Sterilization- Hot Air oven- dry heat, Autoclaving, steam Sterilization. UV treatment, EO Gas & Other new methods of Sterilization.	12

III	Instrument Etching- Material used for Instrument Making, Care of micro surgical and titanium instruments. Sterilization of equipments: - Arthroscope, Gastroscope, OT Light, Endoscope, Suction Apparatus, Sterilization of Anesthetic Equipments including endotracheal tubes, LMAs, Laryngoscope, Breathing Circuits, Face Masks, Airways Etc. OT Sterilization including laminar Air flow use. How to deal with colored spots and corrosion, staining, dust deposit.	11
IV	Anesthesia Crash Cart- Introduction Preparation of Drug Trolley for General Anesthesia & various sections of Drug Trolley. Labelling of Anesthetic Drugs. Preparation & Contents of Spinal Set, Epidural Set, CVP Set & Tracheostomy Set.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Know About Central Sterile Supply Department & its layout.
CO2. To Know in detail the methods & Steps of Sterilization.
CO3. Understanding the methods of cleaning & Disinfecting instruments.
CO4. To know about General Operation Theatre skills.
CO5. To Know how to prepare Anesthesia Trolley & procedure Sets.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	3	3	2	1	2
CO2	2	3	1	2	3	2	3
CO3	2	3	1	2	3	2	3
CO4	4	3	4	3	3	2	4
CO5	4	3	4	4	4	2	4

Reference Books

S. No.	Author(s)	Title	Publisher
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Textbook for Operation room Technician	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	Ajay Yadav	Short Textbook of Anesthesia	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 105-21**			
Subject Title:	**GENERAL PRINCIPLES OF HOSPITAL PRACTICES**			
Contact Hours:	**L:3**	**T:0**	**P:0**	**Credits:3**
Examination Duration (hours)	**3**			
Objective(s):	The objective of this course is to provide a basic insight for the hospital setting and to introduce with the various types of techniques used in the hospitals.			

Details of the Course

Unit	Contents	Contact Hours
I	Hospital procedure: Hospital staffing and organization. Records relating to patients and departmental statistics; Professional attitude of the technologist to patients and other members of the staff. Medico-legal aspects; Accidents in the departments ; Out-patient & In-patient Management. Stock-taking and stock keeping. Record keeping & management of Supplies.	10
II	Infection- Bacteria, their nature and appearance. Spread of infections in Hospital setups. Auto-infection or cross-infection. Prevention of Contamination & cross-infection. Local tissue reaction, general body reaction Ulceration. Asepsis and Antisepsis. Hospital Infection prevention control methods.	9
III	Definition of Biomedical Waste, Types of waste generated from Health Care Facility. Waste minimization. Segregation, collection, transportation, treatment and disposal of waste (including color coding). BMW Classification: Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste. BMW Management & methods of disinfection. Monitoring & controlling of cross infection (Protective devices)	8

IV	Shock, Insensibility; asphyxia; convulsions; Resuscitation & use of suction apparatus, Drug reactions; prophylactic measures; Administration of oxygen; electric shock; burns; scalds; hemorrhage; pressure points; compression band, fractures; splints, bandaging; dressing, foreign bodies; poisons.	8

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Know About General Practices used in Hospitals.
CO2. To Know in detail the methods of BMW Management.
CO3. Understanding the methods of prevention of Infection & Cross-Infection.
CO4. To know about various conditions that can occur in daily hospital practice.
CO5. To Know about hospital staffing & work distribution & Management.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	2	3	3	2	2
CO2	3	3	2	2	2	2	2
CO3	3	2	3	2	3	2	3
CO4	4	3	3	2	3	2	1
CO5	2	1	1	2	2	1	2

Reference Books

S. No.	**Author(s)**	**Title**	**Publisher**
1.	Khar and Nand	A Textbook of hospital pharmacy	Jaypee
2.	Anantpreet & Sukhjit	Biomedical Waste Disposal	Jaypee

SEMESTER-II

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY DEPARTMENT OF ALLIED HEALTH SCIENCES				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 201-21**			
Subject Title:	**ANESTHESIA EQUIPMENTS & TECHNOLOGY**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about Anaesthesia & its Various types in depth.			

Details of the Course

Unit	Contents	Contact Hours
I	Pre-anesthetic medication- Changes, Uses and Pre-operative Fasting. Patient Preparation and transport of patient to the OT. Anaesthesia & Its classification. General Anaesthesia- Components, Triad of Anaesthesia, Balanced Anaesthesia, Stages of General Anaesthesia (Guedel's Classification) Indications of General Anaesthesia, Contraindications of General Anaesthesia. Preparations for General Anaesthesia.	12
II	Gases used in Anaesthesia Intravenous / inhalational or volatile Anaesthetic Muscle relaxants & their classification. Analgesics & Opioids. Dissociative Anesthesia. Preference of Induction agents in Adults & Children. Complications of General Anaesthesia- intraoperative, immediate, Post-operative & delayed Complications. Post-operative care after anesthesia. Advantages of General Anesthesia over Regional Anesthesia.	12

III	**Regional Anaesthesia**- Introduction and classification- Local Block, Peripheral Nerve Block & Central Neuraxial Block-Drugs used in Regional Anaesthesia. Needles used in Regional Anaesthesia. Considerations, Systemic effect & toxicity.Individual Agents used, Methods of Local Anaesthesia, Causes of Failure of Local Anaesthesia. Peripheral Nerve Block- Technique Blocks in Upper Limb, Lower Limb, Head & Neck, Thorax & Abdomen area. Contraindications of Peripheral Nerve Block.	11
IV	**Central Neuraxial Blocks:** Applied Anatomy, Advantages of Central Neuraxial Blocks over General Anaesthesia, Systemic effects & Disadvantages. Spinal Anaesthesia/Block, Intrathecal Block, Saddle Block. Epidural Anaesthesia (Peridural Block) Combined Spinal Epidural Block, Caudal Block Level of Block Required for common Surgeries. Spinal & Epidural Needles.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Pre-Anaesthetic Checkup or Assessment & Premedication.
CO2. Study about Anesthesia, Components & Types of Anaesthesia.
CO3. Know about General Anaesthesia & its advantages.
CO4. Know about Local Anesthetics & General Anesthetics.
CO5. Study about Central Neuraxial Blocks & their Advantages & uses.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	Arun Kumar Paul	Drugs & Equipments in Anaesthetic Practice	Elsevier
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 205-21**			
Subject Title:	**ANESTHESIA EQUIPMENTS & TECHNOLOGY LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about General & regional Anesthesia Techniques.			

Details of the Course

Unit	Contents
I	1. Anesthesia Classification 2. General Anesthesia Technique. 3. Demonstration of Pre-Oxygenation & Intubation. 4. Demonstration of Ventilation during Anesthesia. 5. Understanding Extubation & complications of General Anesthesia.
II	1. Demonstration of Local Anesthesia Techniques 2. Demonstration of Central Neuraxial Techniques. 3. Locating the space for Spinal & Epidural Anesthesia 4. Difference between Spinal & Epidural Needles. 5. Various Techniques used in Regional Anesthesia.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
At the end of the course, the student will be able to **CO1.** Knowledge about Pre-Anaesthetic Checkup or Assessment & Premedication. **CO2.** Study about Anesthesia, Components & Types of Anaesthesia. **CO3.** Know about General Anaesthesia & its advantages. **CO4.** Know about Local Anesthetics & General Anesthetics. **CO5.** Study about Central Neuraxial Blocks & their Advantages & uses.							
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	Arun Kumar Paul	Drugs & Equipments in Anaesthetic Practice	Elsevier
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 202-21**			
Subject Title:	**SURGICAL TOOLS & TECHNIQUES**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various tools & Techniques used in Operation Theatre.			

Details of the Course

Unit	Contents	Contact Hours
I	Introduction of surgery and basic principles of surgeries, surgical team, Surgical safety checklist, various types of surgical incisions, suturing techniques, sutures and its types, Various surgical positions with their complications and management. Pneumatic Tourniquet and its uses, Suffix and prefix related to surgeries. Urinary Catheter, RT & IV Cannula Insertion.	12
II	IV Fluids & their Classification. Blood Transfusion -Indications & Complications. Monitoring in the Operation Theatre. Positioning of Patient During different surgical Procedures. Potential sources of injury to the caregiver & patient Transportation of Patient to OT. Transportation of Critically ill Patient- Inter-Hospital Transportation & Intra-Hospital Transportation.	12

III	Preoperative preparation of the patient Written Informed Consent Review of bladder catheterization Positioning the surgical patient Application of pneumatic tourniquets Skin preparation Drapes and draping Operative instrumentation Hemostasis Drainage systems- Tube Drains & Suction Drains.	11
IV	Specials Precautions taken for Pregnant Patient, Diabetic Patient, HIV Patient, Hemophilic Patient, Infant, Elderly etc. Labour Analgesia Methods, Postoperative pain control methods. Diagnostic procedures in OR: Pathological examination, Radiological examination, MRI, Ultrasonography	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basics of Operation Theatre Techniques.
CO2. Study about IV Fluids & Blood Transfusion.
CO3. Know about Transportation of Patient.
CO4. Know about OT preparation for special cases.
CO5. Study about various diagnostic examinations done for surgical Patient.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 206-21**			
Subject Title:	**SURGICAL TOOLS & TECHNIQUES LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various tools & Techniques used in Operation Theatre.			

Details of the Course

Unit	Contents
I	1. Demonstration of job description of various members of Surgical team. 2. Technique of using Pneumatic Tourniquet. 3. Technique of insertion of Urinary Catheter. 4. Technique of Insertion of IV Cannula. 5. Technique of insertion of Ryle's Tube.
II	1. Demonstration of Transportation of Patient. 2. Technique of Blood Transfusion & Collection. 3. Patient Positioning demonstration. 4. Insertion & removal technique of Drains. 5. Techniques of Suturing.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Demonstration about Basics of Operation Theatre Techniques.
CO2. Study about IV Fluids & Blood Transfusion.
CO3. Know about Transportation of Patient.
CO4. Know about OT preparation for special cases.
CO5. Study about various diagnostic examinations done for surgical Patient.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 203-21**			
Subject Title:	**SURGICAL PROCEDURES**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various common Surgical Procedures.			

Details of the Course

Unit	Contents	Contact Hours
I	I&D, Circumcision, Catherization, stitch removal. Removal of fibromas, tracheostomy. Biopsy and its types, Bone marrow biopsy. Liver biopsy. Renal biopsy. Pleural biopsy. Abdominal paracentesis. Tumors- benign and malignant, Cysts, ulcers, sinuses & fistula, Differential diagnosis of cyst and tumor, Removal of Sebaceous Cyst, Ganglion etc.	12
II	General surgical procedures- Hiatus hernia, Gastrectomy, Partial hepatectomy, Open cholecystectomy, Whipple's procedure, colectomy, gastrostomy, colostomy. Umbilical hernia, inguinal hernia, Appendectomy, difference between herniotomy, hernioplasty, and herniorrhaphy, Hydrocele, hemorrhoidectomy.	12
III	Common orthopedic procedures -ORIF and CRIF, Arthroscopy, THR, TKR, Laminectomy, Herniated disk surgery, Osteotomy, Rotator cuff surgery etc. Incisions given in gynae procedure, episiotomy, D&C, D&E, MTP, MRP, Caesarean section, tubal ligation, abdominal and vaginal hysterectomy, myomectomy, oophorectomy. Lap. Assisted vaginal hysterectomy	11

IV	Laparoscopic procedures – Laparoscopic Cholecystectomy, Lap. Appendectomy, Lap. Inguinal hernia repair techniques (TAPP and TEP), Lap. Partial gastrectomy, etc. Laparoscopic Hysterectomy, Ligation & Tubectomy. Common urological procedures - TURP, TUNA, TUIP, cystoscopy, nephrectomy, ESWL. vasectomy, Orchiopexy and Orchidectomy, PCNL, ureteroscopy,	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basic Surgical Procedures.
CO2. Study about Various Biopsies & tumours.
CO3. Know about General & Laparoscopic Procedures.
CO4. Know about Urological & Gynaecological Procedures.
CO5. Study about various types of common Surgeries done in OTs.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2	Pramila Bhalla	Operation room technician's	APH
3	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 207-21**			
Subject Title:	**SURGICAL PROCEDURES LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various common Surgical Procedures.			

Details of the Course

Unit	Contents
I	1. Technique of Incision & Drainage. 2. Technique of Wound Cleaning & Suturing & Dressing. 3. Technique of Cyst removal. 4. Technique of Biopsy taking. 5. Common General Surgical Procedures.
II	1. Common Urological Procedures. 2. Common Laparoscopic Procedures. 3. Common Orthopedic Procedures. 4. Common Gynecological Procedures.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basic Surgical Procedures.
CO2. Study about Various Biopsies & tumours.
CO3. Know about General & Laparoscopic Procedures.
CO4. Know about Urological & Gynaecological Procedures.
CO5. Study about various types of common Surgeries done in OTs.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 204-21**			
Subject Title:	**SURGICAL INSTRUMENTS & TRAYS**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various Surgical Instruments.			

Details of the Course

Unit	Contents	Contact Hours
I	Fabrication of instruments, Types of surgical needles, Size of blades, Basic classification of instruments, Drains and its types. General instruments, Biliary instruments Orthopedic and Plastic Surgery instruments, Bone cement, Artificial prosthetic implants. Urology instruments Organ procurement and transplantation, Types of transplants, Tissue transplantation, Organ transplantation.	12
II	Instruments used in cardiac surgeries, Pacemaker and its types, Extra-Corporeal Membrane Oxygenator machine. Neurological instruments, Gamma knife . Radiosurgery. Cryosurgery & Cryoprobe. Endoscopes and its types, Robotic machine and its parts, Techniques used. Laparoscopic tower and instruments.	12
III	Major Procedure Tray Minor Procedure Tray Thyroid Tray, Limited Procedures Tray, Long Instruments Tray, Biliary Tract Procedures Tray, Gastrointestinal Procedures Tray, Ano-Rectal Procedures Tray, D&C Tray, Vaginal Hysterectomy Tray, Abdominal Hysterectomy Tray, Cesarean Section Tray, Vasectomy Tray, Prostatectomy Instruments Tray.	11

IV	Bronchoscopy Instruments Tray, Thoracoscopy Tray, Pacemaker Tray, Thoracotomy Tray. Cardiac Procedure Instruments Tray, Open Heart Basic Instruments Tray, Basic Orthopedic Instrument Tray, Knee Arthrotomy Tray, Craniotomy Tray, Laminectomy Tray, Basic Plastic procedures Tray.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basic Surgical Instruments.
CO2. Study about Urological & Plastic Surgery Instruments.
CO3. Know about Pacemaker & its Types.
CO4. Know about different basic procedure Trays.
CO5. Study about advanced procedure Trays.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2	Pramila Bhalla	Operation room technician's	APH
3	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 208-21**			
Subject Title:	**SURGICAL INSTRUMENTS & TRAYS LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various common Surgical Procedures.			

Details of the Course

Unit	Contents
I	1. Basic Surgical Instruments. 2. Needle Holders & Forceps, 3. Scissors and Blades. 4. Laparoscopic Instruments. 5. Basic Procedure Trays.
II	1. Cardiac Surgery Instruments. 2. Study About Pacemakers. 3. Study About ECMO Machine. 4. Bronchoscopy & Thoracoscopy.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basic Surgical Instruments.
CO2. Study about Urological & Plastic Surgery Instruments.
CO3. Know about Pacemaker & its Types.
CO4. Know about different basic procedure Trays.
CO5. Study about advanced procedure Trays.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Ajay Yadav and Arora	Synopsis of medical instruments	Jaypee
2.	Pramila Bhalla	Operation room technician's	APH
3.	M.P. Sharma	Operation Theatre Techniques & Management	AITBS Publishers
4.	M.A. Goldman	Pocket Guide to Operating Room	JAYPEE

SEMESTER-III

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY DEPARTMENT OF ALLIED HEALTH SCIENCES				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 301-21**			
Subject Title:	**ANESTHESIA FOR SPECIAL SURGERIES**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about Anaesthesia used in various special surgeries.			

Details of the Course

Unit	Contents	Contact Hours
I	Anesthesia for Obese patients- Obesity, Surgeries done in Obese patients (Bariatric & Non-bariatric surgeries), Precaution taken during anesthesia for obese patients. Neurosurgical anesthesia- Intra-Cranial Tension, Cerebral Metabolic Rate, Maintaining ICT in Neuro-surgery, Special Precautions during anesthesia for neuro-surgeries. Anesthesia in Laparoscopic surgery- Laparoscopic Surgery meaning, Benefits & complications, Anesthesia used in laparoscopic surgeries along with precautions.	12
II	Anesthesia for Obstetric procedures- Obstetrics & gynecology introduction, Use of Analgesia in obstetrics, Anesthesia in LSCS, Hysterectomy, Pre-eclampsia & Eclampsia. Anesthesia in pediatric patient's surgery- Special precautions taken in Pediatric patients, Use on Inhalational agents, special precautions & equipments used in pediatric surgeries. Anesthesia in Orthopedic surgery- Orthopedic surgery types, use of local, regional & general anesthesia in orthopedic surgeries, special precautions to be taken in orthopedic surgeries.	12

III	Anesthesia in geriatric surgery- Geriatric patient & common complications in geriatric surgeries, special precautions taken in geriatric surgery & modifications done in anesthesia techniques. Anesthesia for Ophthalmic surgery- ophthalmic surgery types & use of Anesthesia, Anesthesia techniques and monitoring in ophthalmic surgeries. Anesthesia in day care surgery- Day care surgery advantages, Day care surgeries, Anesthesia used in day care surgeries & special precautions.	11
IV	Anesthesia for ENT surgery- Various ENT surgeries, Anesthesia Technique modifications in ENT surgeries, Special precautions taken in ENT surgery anesthesia. Anesthesia for management of burn patients- Burn & its degrees, emergency management of burn patient & analgesia techniques and monitoring in burn patients. Anesthesia in Pain management- Pain & its types, various methods of pain management.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Anesthesia techniques in various types of surgeries.
CO2. Know about various modification in Anesthesia for different surgeries.
CO3. Knowledge of different procedures like obstetric, pediatric procedures etc.
CO4. Know about change in techniques & drugs in old & obese patients.
CO5. Study about Pain & its management techniques.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	DANIEL COTTLE & SHONDIPON LAHA	Anaesthetics for Junior Doctors and Allied Professionals	CRC Press
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 305-21**			
Subject Title:	**ANESTHESIA FOR SPECIAL SURGERIES LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about Anaesthesia used in various special surgeries.			

Details of the Course

Unit	Contents
I	1. Anesthesia Techniques used in Obese. 2. Anesthesia Techniques used in Neurosurgery. 3. Anesthesia Techniques used in Laparoscopic procedures. 4. Anesthesia Techniques used in Obstetrics. 5. Anesthesia Techniques used in Pediatric Patients.
II	6. Anesthesia Techniques used in orthopedic surgeries. 7. Anesthesia Techniques used in Geriatric surgeries. 8. Anesthesia Techniques used in ophthalmic surgeries. 9. Anesthesia Techniques used in Day care surgeries. 10. Analgesia Techniques used in pain management.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
At the end of the course, the student will be able to **CO1.** Knowledge about Anesthesia techniques in various types of surgeries. **CO2.** Know about various modification in Anesthesia for different surgeries. **CO3.** Knowledge of different procedures like obstetric, pediatric procedures etc. **CO4.** Know about change in techniques & drugs in old & obese patients. **CO5.** Study about Pain & its management techniques.							
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	G. Smith & A.R. Aitkenhead's	Textbook of Anaesthesia	ELSEVIER
2	Ajay Yadav	Short Textbook of Anaesthesia	JP Brothers
3	DANIEL COTTLE & SHONDIPON LAHA	Anaesthetics for Junior Doctors and Allied Professionals	CRC Press
4	S Ahanatha Pillai	A Manual of Anesthesia for Operation Theatre Technicians	JP Brothers

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 302-21**			
Subject Title:	**INTENSIVE CARE UNIT**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various tools & Techniques used in Intensive Care Unit & also about monitoring in ICU.			

Details of the Course

Unit	Contents	Contact Hours
I	Monitoring in ICU- Cardiac, Respiratory, Temperature, Neuromuscular monitoring. Ventilators- Types & Modes of Ventilation , Respiratory therapy, ABG Machine & uses, Hemodialysis- importance & procedure. Defibrillator, Types of Defibrillator, Principles and mechanism of the defibrillator, Uses and Safety Precautions during use. Perfusion machine-uses & importance, ECG (electrocardiography) , Types of ECG electrodes and leads. Principle and mechanism of ECG machine. Management of Arrhythmias.	12
II	Care and maintenance of ventilators, suction machine, monitoring device. Sterilization and disinfection of ventilators, beds, lights, and other apparatus. Control of pollution in ICU, Care of unconscious patients, Physiotherapy techniques, feeding, Insertion of Ryle's tube, suctioning, Positioning/posturing of semiconscious and unconscious patients.	12

III	Cardiopulmonary resuscitation (CPR)- one rescuer & two rescuer CPR. Basic life support in children & adults, Advanced life support & techniques, Acute Respiratory arrest and Hypoxia Ventilator support, oxygen therapy, maintenance & clear airway. E.T. tube, AMBU bag, Airway, Face Masks & LMAs, Management of Sepsis, Ascites, Acute Poisoning, critically patients, Management of Tetanus patient	11
IV	Intubation- Oral & Nasal Techniques, Tracheostomy, CVP (Central Venus pressure)-use & techniques, Urine Catheterization- male & female catheterization, Insertion of Ryle's tube. Sterilization and disinfections of the equipment's in ICU, Instruments used in ICU & their maintenance.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basics of Intensive Care Unit.
CO2. Study about Monitoring methods used in ICUs.
CO3. Know about Ventilators & their modes.
CO4. Know about various techniques used in ICUs.
CO5. Knowledge of Care & Maintenance of ICU equipments.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Whiteley, Bodenham, Bellamy	Intensive Care	CHURCHIL LIVINGSTONE
2.	Paul L. Marino	The ICU Book	Wolters Kluwer
3.	Prem Kumar	ICU Manual	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 306-21**			
Subject Title:	**INTENSIVE CARE UNIT LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various tools & Techniques used in Intensive Care Unit & also about monitoring in ICU.			

Details of the Course

Unit	Contents
I	1. Ventilators 2. ET Tube insertion 3. Ryle's Tube insertion 4. Cardiopulmonary resuscitation 5. Defibrillation
II	6. LMA insertion 7. Guedel's Airway insertion 8. AMBU bag ventilation 9. CVP insertion 10. Urinary Catheterization

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Basics of Intensive Care Unit.
CO2. Study about Monitoring methods used in ICUs.
CO3. Know about Ventilators & their modes.
CO4. Know about various techniques used in ICUs.
CO5. Knowledge of Care & Maintenance of ICU equipments.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	Whiteley, Bodenham, Bellamy	Intensive Care	CHURCHIL LIVINGSTONE
2.	Paul L. Marino	The ICU Book	Wolters Kluwer
3.	Prem Kumar	ICU Manual	JAYPEE

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 303-21**			
Subject Title:	**ADVANCED SURGICAL TECHNIQUES**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various common Surgical Procedures.			

Details of the Course

Unit	Contents	Contact Hours
I	**Laser Technology**- Definition & Types, Safety precautions & care of laser equipments, **Endoscopy**- Definition & types, Rigid & flexible endoscopes, Safety precautions & handling of Endoscopes.	12
II	**Robotics-** Introduction & types, Advantages of using robotics in surgery, complications of Robotic surgeries, Hazards in Robotic surgery. **Microsurgery-** Introduction & types, use of microscope, type & handling of microscope, care & sterilization of operating microscope.	12
III	**Harmonic Scalpel and Plasma Scalpel-** Definition & uses, advantages over traditional scalpels & knives, precautions & care while handling & storing. Advantages for using the harmonic scalpel over electrosurgery **Laparo-Sonic Cutting Shears-** Definition & use, Principle of Plasma Scalpel & its use, Advantages of the plasma scalpel over electrosurgery	11

IV	**Argon Beam Coagulator-** Introduction, Argon gas features, Safety precautions while using Argon Beam Coagulator, Advantages of Argon Beam Coagulator, Disadvantages. **Radiofrequency Ablation-** Radiofrequency introduction & use, Technique of Radiofrequency Ablation, Safety features & advantages, Disadvantages of Radiofrequency Ablation.	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Advanced Surgical Procedures.
CO2. Study about Various Laser & Robotic Surgeries.
CO3. Know about Argon Beam & Radiofrequency use in Surgery.
CO4. Know about Endoscopes & Operating Microscopes.
CO5. Study about Harmonic Scalpel & Plasma Scalpel.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	John L. Cameron	Advances in Surgery	Elsevier
2	Shawn & Omar	Robotic Assisted Minimally Invasive Surgery	Springer
3	M.A. Goldman	Pocket Guide to Operating Room	F.A. Davis Company

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 307-21**			
Subject Title:	**ADVANCED SURGICAL TECHNIQUES LAB**			
Contact Hours:	**L:0**	**T:0**	**P:3**	**Credits:2**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various common Surgical Procedures.			

Details of the Course

Unit	Contents
I	6. Technique of Laser Surgeries. 7. Precaution while dealing with Laser. 8. Technique of Endoscopy. 9. Handling of Endoscope. 10. Robotic surgery techniques.
II	5. Care & Handling of Robotic arms. 6. Techniques of microsurgery. 7. Harmonic Scalpel. 8. Plasma Scalpel.

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about Advanced Surgical Procedures.
CO2. Study about Various Laser & Robotic Surgeries.
CO3. Know about Argon Beam & Radiofrequency use in Surgery.
CO4. Know about Endoscopes & Operating Microscopes.
CO5. Study about Harmonic Scalpel & Plasma Scalpel.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1.	John L. Cameron	Advances in Surgery	Elsevier
2.	Shawn & Omar	Robotic Assisted Minimally Invasive Surgery	Springer
3.	M.A. Goldman	Pocket Guide to Operating Room	F.A. Davis Company

I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY **DEPARTMENT OF ALLIED HEALTH SCIENCES**				
Course Name	**M.Sc. Medical Technology**			
Subject Code:	**MAOTT 304-21**			
Subject Title:	**APPLIED PHARMACOLOGY FOR ANESTHESIA.**			
Contact Hours:	**L:4**	**T:0**	**P:0**	**Credits:4**
Examination Duration (hours)	**3**			
Objective(s):	The aim and objective of this course is to know about various Surgical Instruments.			

Details of the Course

Unit	Contents	Contact Hours
I	Antisialagogues: Atropine, Glycopyrrolate. Sedatives/Anxiolytics: Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, and Triclofos. Narcotics: Morphine, Pethidine, Fentanyl, Pentazozine, tramadol. Antiemetic's: Metoclopramide, Ondanseteron, Dexamethasone	12
II	Induction Agent: Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate. Muscle Relaxants: Depolarizing - Suxamethonium, Non depolarizing - Vecuronium, Atracurium, rocuranium Inhalational Gases: Gases-02, N20, Air, Agents-Ether ,Halothane, Isofllurane, Saevoflurane, Desflurane Reversal Agents: Neostigmi*ne*, Glycopyrrolate, Atropine, Naloxone, Flumazenil (Diazepam).	12
III	Local Anesthetics: Xylocaine, Bupivacaine - Topical, Prilocaine-jelly, EMLA - Ointment, Etidocaine. Ropivacaine. Emergency Drugs : Mode or administration, dilution, dosage and effects a. Adrenaline, Atropine b. Ephedrine, Mephentramine c. Bicarbonate, calcium, potassium. d. Inotropes: dopamine, dobutamine, amidarone	11

IV	Emergency Drugs : Mode or administration, dilution, dosage and effects e. Aminophylline, hydrocortisone, antihistaminic, f. Antihypertensive –Beta-blockers, Ca-channel blockers. g. Antiarrhythmic- xylocard h. Vasodilators- nitroglycerin & sodium nitroprusside i. Respiratory system- Bronchodilators j. Renal system- Diuretics, frusemide, mannitol	10

Course Outcomes and Mapping

At the end of the course, the student will be able to

CO1. Knowledge about all the Anesthetic drugs & their effects.
CO2. Study about Induction agents & muscle relaxants.
CO3. Know about Emergency drugs & their use.
CO4. Know about dosage of different drugs used in Operation Theatre.
CO5. Study about side effects of various drugs used in Anesthesia.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	3	4	4	4	3	4
CO2	4	3	2	3	4	2	3
CO3	3	2	2	3	4	1	2
CO4	4	4	4	4	4	3	4
CO5	3	3	2	3	3	4	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	KD Tripathi	Text book of pharmacology	Jaypee Brothers
2	Tara Shanbhag, Smita Shenoy	Text book of pharmacology	Elsevier
3	Goodman & Gillman's	The Pharmacological Basis of Therapeutics	McGraw Hill Education
4	R.D. Budhiraja	Elementary Pharmacology and Toxicology	Popular Prakashan