# 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** | **Credi ts** | **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** | **Credi ts** | **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** |

## 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**<br>**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<br>History of Anesthesia. Stages of Anesthesia.<br>Classification of anesthesia<br>Pre-anesthetic check-up of patient, Premedication.<br>Care and preparation of patient in pre-operative ward;<br>Preparation of patient for operation theatre;<br>Management of O.T. before operation.<br>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.<br>Medical gas pipeline system, Alarms and safety devices.<br>Simple oxygen administration devices Face mask, venturi mask and LMA, Flow meters, Regulators.<br>Oral and Nasal endotracheal tubes. Tracheotomy tubes.<br>Airway its features, Types, sizes, Indications and its complication.<br>**Oxygen Therapy:** Definition, hypoxemia, Causes and clinical signs of hypoxemia.<br>Goals of oxygen therapy, Hazards of oxygen therapy. | 12 |

| | | |
|---|---|---|
| III | Laryngoscopy & Types of Laryngoscope, Intubation: Oral intubation, Nasal intubation.<br>Spinal/Lumber anesthesia. General Anesthesia.<br>**Breathing System:**<br>Introduction to breathing system Mapleson breathing system Jackson Rees system<br>Bain circuit, Non breathing valves – Ambu valves.<br>**Gas Analyzers:** Pulse Oximeter. CO2 Monitor. Capnography. | 11 |
| IV | Methods of cleaning and sterilization of anesthetic equipment's.<br>Pipeline system of anesthetic gases;<br>Central pipeline system; compressed gases;<br>Pressure indicators and Alarms; bulk gas cylinders.<br>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**<br>**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.<br>2) Physics in principles of Anaesthesia machine<br>3) Boyle's machine in details.<br>4) Anaesthesia gases,<br>5) Cylinders & Central Pipeline<br>6) Vaporizers, |
| II | **1.** Anaesthetic flow meter,<br>**2.** Different types of Endotracheal tubes and Endo-bronchial tubes.<br>**3.** Breathing circuits,<br>**4.** General anaesthesia.<br>**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**<br>**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.<br>Rules and regulations in operation theatre.<br>Ethics of an OT technician, Carrier path of an OT technician.<br>Biomedical waste management, Personal protective equipments.<br>Introduction of operation theatre,<br>Pre-operative, Post-operative rooms.<br>Operation theatre complex-layout -location, types, zones, size,<br>Care and maintenance of Surgical equipments including open surgery, laparoscopic, endoscopic and robotic equipments<br>Cleaning of O.T.<br>Fumigation of O.T.<br>Sterilization: Methods & Types | 12 |
| II | Operating table<br>O.T lights<br>Diathermy machine (Electro-cautery)<br>General surgical procedures and instruments.<br>Preparation of operation theatre to receive patient.<br>Care of surgical patients.<br>Transportation of surgical patient,<br>Preparation of surgical instruments trolley.<br>Importance of sterilization &preparation of surgical instruments for sterilization. | 12 |

| | | |
|---|---|---|
| III | Preparation of laparoscopic instruments.<br>Cleaning and care of laparoscopic instruments.<br>Incision and its types, Major abdominal incision.<br>Cleaning and care of wound.<br>Dressing materials, different types of Dressings.<br>Dressing procedure.<br>Surgical Positioning and its Types ,<br>Various types of Suture Materials & types of Suturing.<br>Different types of Drains, Catheters, Drip Sets, Bags. | 11 |
| IV | Operating team, operating room staff,<br>Introduction of assisting of surgery,<br>Surgical hand scrubbing, gowning and gloving,<br>Part preparation, drapes and draping.<br>Instruments used for general surgery,<br>Orthopedic surgical instruments,<br>Gynaecology procedure instruments,<br>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**<br>**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.<br>2. Preparation of OT Staff.<br>3. Methods of sterilization in OT- Autoclaving, Fumigation etc.<br>4. Uses of O.T equipments.<br>5. Surgical Incision technique. |
| II | 1. Suture materials.<br>2. Suturing Types- Simple, Mattress, Subcuticular etc.<br>3. Dressing Procedure.<br>4. Drain Types & Uses.<br>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**<br>**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<br>Nose - Role in humidification<br>Pharynx - Obstruction in airways<br>Larynx - Movement or vocal cords, Cord palsies.<br>Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchospasm<br>Alveoli - Layers, Surfactants<br>Respiratory Physiology<br>Control or breathing<br>Respiratory muscles - diaphragm, intercostals | 12 |
| II | Lung volumes - dead space, vital capacity, FRC etc.<br>Pulmonary Function Tests.<br>Pleural cavity - intrapleural pressure, pneumothorax.<br>Work of breathing - airway resistance, compliance<br>Respiratory movements under anaesthesia.<br>Tracheal tug - signs, hiccup<br>Pulmonary Gas Exchange and Acid Base Status<br>Pulmonary circulation –<br>Pulmonary oedema, pulmonary hypertension<br>Respiratory Failure & its Types. | 12 |

| | | |
|---|---|---|
| III | CARDIOVASCULAR SYSTEM<br>Anatomy - Chambers of the heart, major vasculature.<br>Coronary supply<br>Conduction system of Heart.<br>Cardiac output - determinants, heart rate, preload, after load.<br>Coronary blood flow & myocardial oxygen supply<br>ECG – Arrhythmias-Tachycardia and Bradycardia.<br>Hypotension & Hypertension- causes, management.<br>Cardio pulmonary resuscitation. Myocardial infarction.<br>BLS & ACLS. | 11 |
| IV | **Nervous system:**<br>Organization of nervous system,<br>Neuron, Neuroglia, Classification and properties of nerve fiber, electrophysiology,<br>Neuromuscular Junction: Action potential, nerve impulse, receptors, synapse, neurotransmitters.<br>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**<br>**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,<br>2. Cardiac cycle<br>3. Respiratory Rate & Lung Volumes<br>4. Pulmonary Function Tests. |
| II | 1. ECG- Detection of Tachycardia & Bradycardia<br>2. Myocardial Infarction.<br>3. Technique of BLS & ACLS.<br>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**<br>**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.<br>Cleaning and dusting of OT.<br>Methods of cleaning, Composition of dust.<br>General care and testing of instruments :<br>Artery forceps, Hemostatic forceps,<br>Needle holders,<br>Knife, Surgical Blade,<br>Scissor :- use/ abuse,<br>Care of Instruments during surgery. | 12 |
| II | Disinfectants and Cleaning of their instruments.<br>Sterilization - Definition, Methods.<br>Cleaning agents- detergents,<br>Mechanical washing,<br>Ultrasonic cleaner, lubrication & inspection.<br>Various methods of chemical treatment - formalin, glutaraldehyde etc,<br>Thermal Sterilization- Hot Air oven- dry heat,<br>Autoclaving, steam Sterilization.<br>UV treatment, EO Gas & Other new methods of Sterilization. | 12 |

| | | |
|---|---|---|
| III | Instrument Etching- Material used for Instrument Making,<br>Care of micro surgical and titanium instruments.<br>Sterilization of equipments: - Arthroscope, Gastroscope, OT Light, Endoscope, Suction Apparatus,<br>Sterilization of Anesthetic Equipments including endotracheal tubes, LMAs, Laryngoscope, Breathing Circuits, Face Masks, Airways Etc.<br>OT Sterilization including laminar Air flow use.<br>How to deal with colored spots and corrosion, staining, dust deposit. | 11 |
| IV | Anesthesia Crash Cart- Introduction<br>Preparation of Drug Trolley for General Anesthesia & various sections of Drug Trolley.<br>Labelling of Anesthetic Drugs.<br>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**<br>**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.<br>Records relating to patients and departmental statistics;<br>Professional attitude of the technologist to patients and other members of the staff.<br>Medico-legal aspects;<br>Accidents in the departments ;<br>Out-patient & In-patient Management.<br>Stock-taking and stock keeping.<br>Record keeping & management of Supplies. | 10 |
| II | Infection-<br>Bacteria, their nature and appearance.<br>Spread of infections in Hospital setups.<br>Auto-infection or cross-infection.<br>Prevention of Contamination & cross-infection.<br>Local tissue reaction, general body reaction<br>Ulceration.<br>Asepsis and Antisepsis.<br>Hospital Infection prevention control methods. | 9 |
| III | Definition of Biomedical Waste, Types of waste generated from Health Care Facility.<br>Waste minimization.<br>Segregation, collection, transportation, treatment and disposal of waste (including color coding).<br>BMW Classification: Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste.<br>BMW Management & methods of disinfection.<br>Monitoring & controlling of cross infection (Protective devices) | 8 |

| | | |
|---|---|---|
| IV | Shock, Insensibility; asphyxia; convulsions;<br>Resuscitation & use of suction apparatus,<br>Drug reactions; prophylactic measures;<br>Administration of oxygen; electric shock; burns; scalds;<br>hemorrhage; pressure points; compression band, fractures; splints,<br>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**<br>**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.<br>Patient Preparation and transport of patient to the OT.<br>Anaesthesia & Its classification.<br>General Anaesthesia- Components, Triad of Anaesthesia,<br>Balanced Anaesthesia,<br>Stages of General Anaesthesia (Guedel's Classification)<br>Indications of General Anaesthesia, Contraindications of General Anaesthesia. Preparations for General Anaesthesia. | 12 |
| II | Gases used in Anaesthesia<br>Intravenous / inhalational or volatile Anaesthetic<br>Muscle relaxants & their classification.<br>Analgesics & Opioids.<br>Dissociative Anesthesia.<br>Preference of Induction agents in Adults & Children.<br>Complications of General Anaesthesia- intraoperative, immediate,<br>Post-operative & delayed Complications.<br>Post-operative care after anesthesia.<br>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.<br>Peripheral Nerve Block- Technique<br>Blocks in Upper Limb, Lower Limb, Head & Neck, Thorax & Abdomen area.<br>Contraindications of Peripheral Nerve Block. | 11 |
| IV | **Central Neuraxial Blocks:**<br>Applied Anatomy,<br>Advantages of Central Neuraxial Blocks over General Anaesthesia, Systemic effects & Disadvantages.<br>Spinal Anaesthesia/Block, Intrathecal Block, Saddle Block.<br>Epidural Anaesthesia (Peridural Block)<br>Combined Spinal Epidural Block, Caudal Block<br>Level of Block Required for common Surgeries.<br>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**<br>**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<br>2. General Anesthesia Technique.<br>3. Demonstration of Pre-Oxygenation & Intubation.<br>4. Demonstration of Ventilation during Anesthesia.<br>5. Understanding Extubation & complications of General Anesthesia. |
| II | 1. Demonstration of Local Anesthesia Techniques<br>2. Demonstration of Central Neuraxial Techniques.<br>3. Locating the space for Spinal & Epidural Anesthesia<br>4. Difference between Spinal & Epidural Needles.<br>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<br>**CO1.** Knowledge about Pre-Anaesthetic Checkup or Assessment & Premedication.<br>**CO2.** Study about Anesthesia, Components & Types of Anaesthesia.<br>**CO3.** Know about General Anaesthesia & its advantages.<br>**CO4.** Know about Local Anesthetics & General Anesthetics.<br>**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**<br>**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,<br>Surgical safety checklist,<br>various types of surgical incisions,<br>suturing techniques, sutures and its types,<br>Various surgical positions with their complications and management.<br>Pneumatic Tourniquet and its uses,<br>Suffix and prefix related to surgeries.<br>Urinary Catheter, RT & IV Cannula Insertion. | 12 |
| II | IV Fluids & their Classification.<br>Blood Transfusion -Indications & Complications.<br>Monitoring in the Operation Theatre.<br>Positioning of Patient During different surgical Procedures.<br>Potential sources of injury to the caregiver & patient<br>Transportation of Patient to OT.<br>Transportation of Critically ill Patient- Inter-Hospital Transportation & Intra-Hospital Transportation. | 12 |

| | | |
|---|---|---|
| III | Preoperative preparation of the patient<br>Written Informed Consent<br>Review of bladder catheterization<br>Positioning the surgical patient<br>Application of pneumatic tourniquets<br>Skin preparation<br>Drapes and draping<br>Operative instrumentation<br>Hemostasis<br>Drainage systems- Tube Drains & Suction Drains. | 11 |
| IV | Specials Precautions taken for Pregnant Patient, Diabetic Patient, HIV Patient, Hemophilic Patient, Infant, Elderly etc.<br>Labour Analgesia Methods,<br>Postoperative pain control methods.<br>Diagnostic procedures in OR:<br>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**<br>**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.<br>2. Technique of using Pneumatic Tourniquet.<br>3. Technique of insertion of Urinary Catheter.<br>4. Technique of Insertion of IV Cannula.<br>5. Technique of insertion of Ryle's Tube. |
| II | 1. Demonstration of Transportation of Patient.<br>2. Technique of Blood Transfusion & Collection.<br>3. Patient Positioning demonstration.<br>4. Insertion & removal technique of Drains.<br>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**<br>**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.<br>Removal of fibromas, tracheostomy.<br>Biopsy and its types, Bone marrow biopsy. Liver biopsy. Renal biopsy. Pleural biopsy. Abdominal paracentesis.<br>Tumors- benign and malignant,<br>Cysts, ulcers, sinuses & fistula,<br>Differential diagnosis of cyst and tumor,<br>Removal of Sebaceous Cyst, Ganglion etc. | 12 |
| II | General surgical procedures-<br>Hiatus hernia, Gastrectomy, Partial hepatectomy,<br>Open cholecystectomy, Whipple's procedure, colectomy, gastrostomy, colostomy.<br>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.<br>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 –<br>Laparoscopic Cholecystectomy, Lap. Appendectomy,<br>Lap. Inguinal hernia repair techniques (TAPP and TEP),<br>Lap. Partial gastrectomy, etc.<br>Laparoscopic Hysterectomy, Ligation & Tubectomy.<br>Common urological procedures - TURP, TUNA, TUIP, cystoscopy,<br>nephrectomy, ESWL. vasectomy, Orchiopexy and Orchidectomy,<br>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**<br>**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.<br>2. Technique of Wound Cleaning & Suturing & Dressing.<br>3. Technique of Cyst removal.<br>4. Technique of Biopsy taking.<br>5. Common General Surgical Procedures. |
| II | 1. Common Urological Procedures.<br>2. Common Laparoscopic Procedures.<br>3. Common Orthopedic Procedures.<br>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**<br>**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.<br>General instruments, Biliary instruments<br>Orthopedic and Plastic Surgery instruments,<br>Bone cement, Artificial prosthetic implants.<br>Urology instruments<br>Organ procurement and transplantation, Types of transplants, Tissue transplantation, Organ transplantation. | 12 |
| II | Instruments used in cardiac surgeries,<br>Pacemaker and its types,<br>Extra-Corporeal Membrane Oxygenator machine.<br>Neurological instruments, Gamma knife .<br>Radiosurgery. Cryosurgery & Cryoprobe.<br>Endoscopes and its types, Robotic machine and its parts, Techniques used.<br>Laparoscopic tower and instruments. | 12 |
| III | Major Procedure Tray<br>Minor Procedure Tray<br>Thyroid Tray, Limited Procedures Tray, Long Instruments Tray,<br>Biliary Tract Procedures Tray,<br>Gastrointestinal Procedures Tray,<br>Ano-Rectal Procedures Tray,<br>D&C Tray, Vaginal Hysterectomy Tray,<br>Abdominal Hysterectomy Tray,<br>Cesarean Section Tray,<br>Vasectomy Tray, Prostatectomy Instruments Tray. | 11 |

| | | |
|---|---|---|
| IV | Bronchoscopy Instruments Tray,<br>Thoracoscopy Tray, Pacemaker Tray, Thoracotomy Tray.<br>Cardiac Procedure Instruments Tray,<br>Open Heart Basic Instruments Tray,<br>Basic Orthopedic Instrument Tray, Knee Arthrotomy Tray,<br>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 |

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| 3 | M.P. Sharma | Operation Theatre Techniques & Management | AITBS Publishers |
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| **I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY**<br>**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.<br>2. Needle Holders & Forceps,<br>3. Scissors and Blades.<br>4. Laparoscopic Instruments.<br>5. Basic Procedure Trays. |
| II | 1. Cardiac Surgery Instruments.<br>2. Study About Pacemakers.<br>3. Study About ECMO Machine.<br>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 |

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