GURU KASHI UNIVERSITY

Masters in Operation Theatre & Anaesthesia Technology

Session: 2023-24

Department of Paramedical Sciences

Graduate Outcomes of the Programme:

The programme M.Sc. OT & AT imparts to the students an intensive knowledge in the field of Operation Theaters and Anesthesia Techniques. After completion of this programme graduates will be able to work independently in the operation theatre, anesthetic department and can do further research in the particular field.

Programme Learning Outcomes: After completion of this programme learner will be able to:

1. Undertake further advanced research of the highest quality that contributes to knowledge and exhibits authoritative international standing in their own specialization.
2. Make potentially innovative, and important contributions to society, culture, and the global community.
3. Conduct original and rigorous research, contributing new knowledge and insights to their field of study.
4. Formulate effective planning and time management to meet research deadlines and balance academic commitments.
5. Explore new innovations and remain updated with the latest developments in their field.
6. Think critically and creatively, exploring novel approaches to problem-solving and research question.

Programme structure

Semester -I							
Sr. No.	**Course Code**	**Course Title**	**Type of course**	**L**	**T**	**P**	**Credits**
1	MOA101	Principles of Anesthesia Technology	Core	4	0	0	4
2	MOA102	Surgical Equipment And Technology	Core	4	0	0	4
3	MOA103	Anatomy & Physiology	Core	4	0	0	4
4	MOA104	Surgical Equipment And Technology	Skill Based	0	0	4	2
5	MOA105	Anatomy & Physiology	Skill Based	0	0	4	2
Discipline Elective (Any one of the following)							
6	MOA106	General Principles of Hospital Practices	Disciplinary Elective	3	0	0	3
7	MOA107	Fundamentals of Operation Theatre					
Discipline Elective (Any one of the following)							
8	MOA108	Anesthetic Equipment And Instruments	Disciplinary Elective	3	0	0	3
9	MOA109	Principles of Sterilization techniques & Infection control					
			Total	**18**	**0**	**8**	**22**

Semester -II							
Sr. No.	**Course Code**	**Course Title**	**Type of course**	**L**	**T**	**P**	**Credits**
1	MOA201	General Medicines Relevant To Anesthesia	Core	4	0	0	4
2	MOA202	Surgical Procedures With Anesthesia	Core	4	0	0	4
3	MOA203	Advanced Surgical Instruments	Core	4	0	0	4
4	MOA204	Surgical Procedures With Anesthesia	Skill Based	0	0	4	2
5	MOA205	Advanced Surgical Instruments	Skill Based	0	0	4	2
Value Added Course (For other disciplines also)							
6	MOA206	Principles of Total Quality Management	VAC	2	0	0	2
Disciplinary Elective (one of the following)							
7	MOA207	Microbiology and Pathology	Disciplinary Elective	3	0	0	3
8	MOA208	Transfusion Medicine					
Disciplinary Elective (one of the following)							
9	MOA209	Principles of Anesthesia	Disciplinary Elective	3	0	0	3
10	MOA210	Surgical Tools And Techniques					
			Total	**20**	**0**	**8**	**24**

Semester -III							
Sr. No.	**Course Code**	**Course Title**	**Type of course**	**L**	**T**	**P**	**Credits**
1	MOA301	Research Methodology	Compulsory Foundation	4	0	0	4
2	MOA302	Research Proposal	Research Skill	2	0	4	4
3	MOA303	Ethics & IPR	Research Skill	2	0	0	2
4	MOA304	Proficiency in Teaching	Research Skill	0	0	4	2
5	MOA305	Service Learning	Research Skill	0	0	4	2
6	MOA306	Computer Lab	Skill Based	0	0	4	2
7	MOA399	XXXX	MOOC	0	0	0	4
			Total	**8**	**0**	**12**	**20**

Semester-IV							
Sr. No.	**Course Code**	**Course Title**	**Type of course**	**L**	**T**	**P**	**Credits**
1	MOA401	Dissertation	Skill Based	0	0	0	20
			Total	**0**	**0**	**0**	**20**

Evaluation Criteria for Theory Courses

A. Continuous Assessment: [25 Marks]

CA1- Surprise Test (Two best out of three) (10 Marks)
CA2- Assignment(s) (10 Marks)
CA3- Term paper/ Quiz/Presentation (05 Marks)

B. Attendance (05 Marks)
C. Mid-Semester Test: (30 Marks)
D. End-Semester Exam: (40 Marks)

Semester 1st

Course Title: Principles of Anaesthesia Technology

Course Code: MOA101

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: After completion of this course, the learner will be able to:

1. Perform pre-operative patient assessments, including reviewing medical histories and identifying potential anesthesia-related risks.
2. Evaluate patients' physical and psychological conditions to determine their suitability for anesthesia.
3. Administer anesthesia medications following established protocols and guidelines.
4. Monitor patients' responses to anesthesia drugs and make necessary adjustments under supervision.

Course Contents

UNIT-I **15 Hours**

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.

UNIT-II **15 Hours**

Care and monitoring of patient in post-operative ward. 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, venture 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

UNIT-III **15 Hours**

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, Scenography.

UNIT-IV **15 Hours**

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. Multipara meter Monitors, Types of monitoring; Commonly used I.V.fluids; Central nervous system monitoring; Neuromuscular monitoring, Blood loss monitoring.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *G. Smith & A.R. Textbook of Anaesthesia ELSEVIERAitkenhead's Ajay Yadav Short Textbook of JP Brothers Anaesthesia*
- *Arun Kumar Paul Drugs & Equipments in ElsevierAnaesthetic Practice S Ahanatha Pillai A Manual of Anesthesia for JP BrothersOperation Theatre Technicians*

Course Title: Surgical Equipment and Technology

Course Code: MOA102

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: After completion of this course, the learner will be able to:

1. Describe the fundamental principles and components of common surgical instruments and equipment.
2. Explain the purpose and functionality of various surgical tools, including their uses in different surgical procedures.
3. Describe methods and protocols for cleaning, disinfection, and sterilization of surgical tools.
4. Diagnose common issues and malfunctions in surgical equipment and apply appropriate troubleshooting techniques.

Course Content

UNIT-I **15 Hours**

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 equipment's. Introduction of operation theatre, Pre-operative, Post-operative rooms. Operation theatre complex-layout -location, types, zones, size, Care and maintenance of surgical equipment's including open surgery, Laparoscopic, endoscopic and robotic equipment's Cleaning of O.T Fumigation of O.T. Sterilization.

UNIT-II **15 Hours**

Methods & Types 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.

UNIT-III **15 Hours**

Importance of sterilization &preparation of surgical instruments for sterilization 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.

UNIT-IV **15 Hours**

Types, of Suture Materials & types of Suturing. Different types of Drains, Catheters, Drip Sets, and Bags. 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, Gynecology procedure instruments, Minor surgical procedure instruments.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Ajay Yadav and Arora Synopsis of medical instruments Jaypee Pramila Bhalla Operation room technician's APH M.P. Sharma Operation Theatre Techniques & AITBS Publishers Management*

Course Title: Anatomy & Physiology

Course Code: MOA103

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: After completion of this course, the learner will be able to:

1. Demonstrate a comprehensive understanding of the major systems of the human body, including the musculoskeletal, cardiovascular, respiratory, digestive, nervous, and endocrine systems.
2. Interpret and use anatomical terminology to describe the location and relationships of structures within the body.
3. Describe the structures and functions of organs and tissues, including their gross and microscopic anatomy.
4. Identify and describe the bones of the human skeleton, including their locations, functions, and common anatomical landmarks.

Course contents

UNIT-I **15 Hours**

Structure and function of the respiratory tract in relation to respiratory 12 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, intercostal Lung volumes - dead space, vital capacity, FRC Pulmonary Function Tests.

UNIT-II **15 Hours**

Pleural cavity – intra-pleural pressure, pneumothorax. Work of breathing - airway resistance, compliance Respiratory movements under anesthesia Tracheal tug - signs, hiccup Pulmonary Gas Exchange and Acid Base Status Pulmonary circulation –Pulmonary edema, pulmonary hypertension Respiratory Failure & its Types

UNIT-III **15 Hours**

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.

UNIT-IV **15 Hours**

BLS & ACLS.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.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Ross & Wilson Anatomy and Anne Waugh, Churchill Physiology Allison Grant Livingstone Principles of Anatomy & Physiology Tortora & Bryan WILEY.*

Course Title: Surgical Equipment and Technology (Practical)

Course Code: MOA104

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On completion of this course, the learner will be able to

1. Identify and describe various surgical instruments and equipment used in different surgical procedures.
2. Explain the specific functions and uses of surgical instruments.
3. Demonstrate knowledge of best practices for cleaning, sterilizing, and maintaining surgical instruments.
4. Collaborate effectively with surgical teams, including surgeons, nurses, anesthesiologists, and other healthcare professionals.

Course contents

List of Experiments/ Practical's

1. Observation & Demonstration of Preparation of OT for surgery.
2. Preparation of OT Staff. Methods of sterilization in OT- Autoclaving, Fumigation etc.
3. Uses of O.T equipment's. Surgical Incision technique. Suture materials.
4. Suturing Types- Simple, Mattress, Subcuticular etc. Dressing Procedure.
5. Drain Types & Uses. Handling of Instruments.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Ajay Yadav and Arora Synopsis of medical instruments Jaypee Pramila Bhalla Operation room technicians.*
- *APH M.P. Sharma Operation Theatre Techniques & AITBS Publishers Management M.A. Goldman Pocket Guide to Operating Room JAYPEE Shenoy Nileshwar Manipal Manual of Instruments CBS Publications*

Course Title: Anatomy & Physiology(Practical)

Course Code: MOA105

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On completion of this course, the learner will be able to

1. Demonstrate a comprehensive understanding of the major systems of the human body, including the musculoskeletal, cardiovascular, respiratory, digestive, nervous, and endocrine systems.
2. Interpret and use anatomical terminology to describe the location and relationships of structures within the body.
3. Describe the structures and functions of organs and tissues, including their gross and microscopic anatomy.
4. Identify and describe the bones of the human skeleton, including their locations, functions, and common anatomical landmarks.

Course contents

List of Experiments/ Practical's

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

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Ross & Wilson Anatomy and Anne Waugh, Churchill Physiology Allison Grant Livingstone*
- *Principles of Anatomy & Physiology Tortora & Bryan WILEY Textbook of Medical Physiology Guyton & Hall Elsevie.*

Course Title: General Principle of Hospital Practice

Course Code: MOA106

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On completion of this course, the learner will be able to

1. General Practices used in Hospitals and detail the methods of BMW Management.
2. Understanding the methods of prevention of Infection & Cross-Infection.
3. Analysis various conditions that can occur in daily hospital practice.
4. Elaborate skills about hospital staffing & work distribution & Management

Course contents

UNIT-I **10 Hours**

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.

UNIT-II **15 Hours**

Stock-taking and stock keeping. Record keeping & management of Supplies. 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 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:

UNIT-III **10 Hours**

Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste. BMW Management & methods of disinfection. Monitoring &controlling of cross infection (Protective devices) Shock, Insensibility; asphyxia; convulsions; Resuscitation & use of suction apparatus,

UNIT-IV **10 Hours**

Drug reactions; prophylactic measures; Administration of oxygen; electric shock; burns; scalds; hemorrhage; pressure points; compression band, fractures; splints, bandaging; dressing, foreign bodies; poisons

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Khar and Nand A Textbook of hospital pharmacy Jaypee Anantpreet & Sukhjit Biomedical Waste Disposal Jaypee.*

Course Title: Fundamentals of Operation Theatre

Course Code: MOA107

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On completion of this course, the learner will be able to

1. Describe the roles and responsibilities of various team members in the OR.
2. Examine the methods of cleaning & disinfecting instruments.
3. Demonstrate about General Operation Theatre skills.
4. Analysis the preparation of Anesthesia Trolley & procedure sets.

Course contents

UNIT-I **10 Hours**

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,

UNIT-II **10 Hours**

Care of Instruments during surgery. 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.

UNIT-III **10 Hours**

Thermal Sterilization- Hot Air oven- dry heat, Autoclaving, steam Sterilization. UV treatment, EO Gas & Other new methods of Sterilization. Instrument Etching- Material used for Instrument Making, Care of micro surgical and titanium instruments. Sterilization of equipment's: - Arthroscopy, Gastroscopy, OT Light, Endoscope, Suction Apparatus,

UNIT-IV **15 Hours**

Sterilization of Anesthetic Equipment's including endotracheal tubes, LMAs, Laryngoscope, Breathing Circuits, Face Masks, and Airways Etc. OT Sterilization including laminar Air flow use. How to deal with colored spots and corrosion, staining, dust deposit. IV Anesthesia Crash Cart Introduction 10 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.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Ajay Yadav and Arora Synopsis of medical instruments Jaypee NPramila Bhalla.*
- *Textbook for Operation room APH Technician M.P. Sharma Operation Theatre Techniques & AITBS Publishers Management*
- *Ajay Yadav Short Textbook of Anesthesia JAYPEE*

Course Title: Anaesthetic Equipment's and Instruments

Course Code: MOA108

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: After completion of this course, the learner will be able to:

1. Demonstrate about Pre-Anesthetic Checkup or Assessment & Premedication.
2. Express about Anesthesia, Components & Types of Anesthesia.
3. Elaborate General Anesthesia & its advantages.
4. Analysis to Local Anesthetics & General Anesthetics.

Course contents

UNIT-I **15 Hours**

Pre-anesthetic medication- Changes, Uses and Pre-operative Fasting. Patient Preparation and transport of patient to the OT. Anesthesia & Its classification. General Anesthesia- Components, Triad of Anesthesia, Balanced Anesthesia, Stages of General Anesthesia (Guedel's Classification) Indications of General Anesthesia, Contraindications of General Anesthesia. Preparations for General Anesthesia. Gases used in Anesthesia Intravenous inhalational or volatile anesthetic Complications of General Anesthesia- intraoperative, immediate, Post-operative & delayed Complications. Post-operative care after anesthesia. Advantages of General Anesthesia over Regional Anesthesia.

UNIT-II **10 Hours**

Muscle relaxants & their classification. Analgesics & Opioids. Dissociative Anaesthesia. Preference of Induction agents in Adults & Children. Regional Anesthesia- Introduction and classification- Local Block, Peripheral Nerve Block & Central Neuraxial Block-Drugs used in Regional Anesthesia. Needles used in Regional Anesthesia. Considerations, Systemic effect &toxicity. Individual Agents used,

UNIT-III **10 Hours**

IV Central Neuraxial Blocks Applied Anatomy, Advantages of Central Neuraxial Blocks over General Anesthesia, Systemic effects &Disadvantages. Spinal Anesthesia/Block, Intrathecal Block, Saddle Block. Epidural

Anesthesia (Epidural Block) Combined Spinal Epidural Block, Caudal Block Level of Block Required for common Surgeries. Spinal & Epidural Needles Methods of Local Anesthesia, Causes of Failure of Local Anesthesia.

UNIT-IV **10 Hours**

Peripheral Nerve Block- Technique Blocks in Upper Limb, Lower Limb, Head & Neck, Thorax & Abdomen area. Contraindications of Peripheral Nerve Block.

Transactional modes
Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *G. Smith & A.R. Textbook of Anesthesia ELSEVIER Aitkenhead's Ajay Yadav Short Textbook of JP Brothers Anaesthesia*
- *Arun Kumar Paul Drugs & Equipments in Elsevier Anaesthetic Practice*
- *S Ahanatha Pillai A Manual of Anesthesia for JP Brothers Operation Theatre Technicians.*

Course Title: Principles of Sterilization techniques & Infection control
Course Code: MOA109

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: After completion of this course, the learner will be able to

1. Enables the students to understand the central sterile department.
2. Maintain an accurate record of the effectiveness of the cleaning, disinfecting and sterilizing processes.
3. Manage adequate inventory of supplies and equipment.
4. Apply sterilization by radiation (Gamma rays, ultraviolet rays).

UNIT-I **10 Hours**

Principles of sterilization and disinfection. Methods of sterilization Dry Sterilization. Wet sterilization.

UNIT-II **10 Hours**

Gaseous sterilization. Chemical sterilization. Sterilization by radiation (Gamma rays, ultraviolet rays) Techniques of sterilization of rubber articles. (LMA, FOB, ETT, Laryngoscopes, Anesthesia machines and circuits.)

UNIT-III **10 Hours**

Sterilization: Principle and methods of sterilization, physical, chemical, mechanical and radiation. First aid: Aims and objectives of first aid; wounds and bleeding, dressing and bandages; pressure and splints, support.

UNIT-IV **15 Hours**

Hazards of sterilization. Prevention of hazards of sterilization. Precautions to be taken during sterilization. Recent advances in the methods of sterilization

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Karpinski, C., &Rosenbloom, C.A.(2017). Sports nutrition:a handbook for professionals.*
- *Academy of Nutrition and Dietetics Kusuda, K., Yamashita, K.Ohnishi, A, Tanaka, K., Komino, M.,Honda,H. &Oh-ta,Y.(2016).*
- *Management of surgical linstruments with radio frequency identification ags.A Textbook of hospital pharmacy by Nand and Khar, JP publicatio.*

Course Title: General Medicines Relevant To anaesthesia

Course Code: MOA201

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: On successful completion of this course, the students will be able to

1. Conduct thorough preoperative assessments to evaluate patients' medical histories, physical conditions, and medication regimens.
2. Identify and assess any preexisting medical conditions that may affect anesthesia management.
3. Formulate appropriate anesthesia plans tailored to the patient's medical condition and the planned surgical procedure.
4. Select and administer anesthesia medications and techniques that are suitable for patients with specific medical conditions.

Course contents

UNIT-I **15 Hours**

Diabetes Mellitus, Hypertension, Ischemic heart disease Obesity Elderly Patient Pregnancy Shock COPD Chronic renal failure chronic liver disease/failure Anemia.

UNIT-II **15 Hours**

Pediatric patient Infant Neonate Epilepsy CVA anesthetic agents. Definition of general and local anesthetics. Classification of general anesthetics.

UNIT-III **15 Hours**

Pharmacokinetics and Pharmacodynamics of inhaled anesthetic agents. Intravenous general anesthetic agents. Local anesthetics - classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.

UNIT-IV **15 Hours**

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

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and*
- *Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.*
- *K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, EMCA House, 23/23, Bansari Road,Daryaganj, New Delhi. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.*

Course Title: Surgical Procedures With anaesthesia
Course Code: MOA202

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: On successful completion of this course, the students will be able to

1. Formulate appropriate anesthesia plans tailored to the specific surgical procedure, patient's medical history, and individualized needs.
2. Calculate drug dosages and titrate medications to achieve appropriate levels of anesthesia.
3. Implement advanced monitoring techniques to assess and manage patients' vital signs, oxygenation, and depth of anesthesia during surgery.
4. Demonstrate proficiency in airway management techniques, including intubation, mask ventilation, and use of advanced airway devices.

Course Content

UNIT-I **15 Hours**

Operation tables Features, material used in fabrication and advantages of the material. Care, maintenance and uses. Controls-Hydraulic system, Electrical System. Diathermy/Cautery Machine Different types of diathermy and cautery machines, monopolar, Bipolar and underwater working Structural features of diathermy and cautery machines. Types of active and passive electrodes are, maintenance and uses. Prevention of hazards.

UNIT-II **15 Hours**

History of Surgery, role of the surgeon, importance of team work and anticipating the needs of surgeons; types of incision and indications for the use of particular incision; minimally invasive surgeries.

UNIT-III **15 Hours**

Percutaneous insertion of catheters Hemorrhage-signs and symptoms of internal and external; classification and management, operative and post-operative care of the surgical patient; Emergency procedures;
Knowledge of surgical asepsis, skin preparation for invasive procedures.

UNIT - IV **15 Hours**

Integumentary & minimally invasive surgeries Percutaneous insertion of catheters Requirements during intubation in a case of cervical spine fracture including fiber- optic laryngoscope, awake intubation, LMA family especially ILMA. Anesthetic and surgical requirements during aneurysm surgery.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *E Brown, A. (2001). Benson's Microbiological Applications Laboratory Manual in General Microbiology-Alfred E Brown.*
- *Kowalska, E., Maliszewska, B., & Ziarno, M. (2021). Characterization of Fermented Milks After the Passaging Process of Starter Cultures. Postępy Techniki Przetwórstwa Spożywczego.*
- *. Parija, S. C. (2013). Textbook of Microbiology & Immunology E-book. Elsevier Health Sciences. Vala, S. (2021). Prevalence of ASO Antibodies among Suspected Patients for Streptococcal Infections at Sir Takhtsinhji Hospital, Bhavnagar.*
- *Saudi J Pathol Microbiol, 6(10), 386-389. Brown, A., & Smith, H. (2014). Benson's Microbiological Applications, Laboratory Manual in General Microbiology, Short Version. McGraw-Hill Education.*

Course Title: Advanced Surgical Instruments

Course Code: MOA203

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: On successful completion of this course, the students will be able to

1. Classify and categorize advanced surgical instruments based on their functions, design, and specific surgical specialties.
2. Identify and differentiate advanced surgical instruments accurately, including those used in specialized procedures.
3. Demonstrate advanced techniques for handling, manipulating, and passing surgical instruments with precision.
4. Apply advanced surgical instrument techniques in complex surgical procedures, including delicate dissections, suturing, and tissue manipulation.

Course Contents

UNIT- I **18 Hours**

Storing sterilization and disinfections in OT
General Surgical Principles and instruments: the surgical patient operation room technique
Instrument used for preparing surgical Cheatle forceps, Rampley sponge holding forceps, Mayo's towel clip, Esmarch bandage, simple tourniquet, Pneumatic tourniquet.

UNIT- 2 **18 Hours**

Incision making method and instruments: Bard parker knife handle, major abdominal incision artery forceps and their types instruments used in homeostasis, Kocher's forceps, electric cautery, Retractor: Single hook retractor, Czerny's retractor, nerve hook retractor, Morris retractor, Deaver's retractor.

UNIT-3 **12 Hours**

Care and washing sterilization and maintenance of endoscopic instruments, laparoscopic instruments, orthopedic power instruments, advanced OT tables and their attachments. Types settings and use of: Image intensifier

portable X-Ray machine, cautery machine, suction machine, pulse oximeter, cardiac monitor.

UNIT-4 **12 Hours**

Wound management: scissors and its types, sucking material and techniques, disinfectants and irritant dressing procedures, different types of bandages, surgical needle and needle holders, various types of suture material

Transaction Mode-

Video based teaching, collaborative teaching, case based teaching, question

Suggested Readings

- *Morgan, G. E., Mikhail, M. S., & Murray, M. J. (2002). Clinical anesthesiology (No. RD 81. M67 2002).*
- *Butterworth, J. F., Mackey, D. C., & Wasnick, J. D. (2018). Morgan and Mikhail's clinical anesthesiology. McGraw-Hill Education. nGoldman, M. A. (2019).*
- *Pocket guide to the operating room. FA Davis. Kaplan, J. A. (2018). Essentials of Cardiac Anesthesia for Noncardiac Surgery E-Book:*
- *A Companion to Kaplan's Cardiac Anesthesia. Elsevier Health Sciences. Hessel II, E. A., & Egan, T. D. (2020). Michael K. Cahalan: In Celebration of His Life and Contributions to Cardiac Anesthesiology.*
- *Journal of Cardiothoracic and Vascular Anesthesia, 34(1), 12-19. Kaplan, J. A. (2016). Kaplan's Cardiac Anesthesia E-Book: In Cardiac and Noncardiac Surgery. Elsevier Health Sciences.*

Course Title: Surgical Procedures With Anaesthesia (Practical)
Course Code: MOA204

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On successful completion of this course, the students will be able to

1. Formulate appropriate anesthesia plans tailored to the specific surgical procedure, patient's medical history, and individualized needs.
2. Calculate drug dosages and titrate medications to achieve appropriate levels of anesthesia.
3. Implement advanced monitoring techniques to assess and manage patients' vital signs, oxygenation, and depth of anesthesia during surgery.
4. Demonstrate proficiency in airway management techniques, including intubation, mask ventilation, and use of advanced airway devices.

Course Contents

List of Experiments/Practical's

1. Operation tables Features, material used in fabrication and advantages of the material. Care, maintenance and uses.
2. Controls-Hydraulic system, Electrical System. Diathermy/Cautery Machine Different types of diathermy and cautery machines, monopolar, Bipolar and underwater working Structural features of diathermy and cautery machines.
3. Percutaneous insertion of catheters Hemorrhage-signs and symptoms of internal and external; classification and management, operative and post-operative care of the surgical patient.
4. Emergency procedures; Knowledge of surgical asepsis,
5. Skin preparation for invasive procedures Requirements during intubation in a case of cervical spine fracture including fiber- optic laryngoscope, awake intubation.
6. Types of incision and indications for the use of particular incision; minimally invasive surgeries

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *E Brown, A. (2001). Benson's Microbiological Applications Laboratory Manual in General Microbiology-Alfred E Brown.*
- *Kowalska, E., Maliszewska, B., & Ziarno, M. (2021). Characterization of Fermented Milks After the Passaging Process of Starter Cultures. Postępy Techniki Przetwórstwa Spożywczego. .*
- *Parija, S. C. (2013). Textbook of Microbiology & Immunology E-book. Elsevier Health Sciences. Vala, S. (2021). Prevalence of ASO Antibodies among Suspected Patients for Streptococcal Infections at Sir Takhtsinhji Hospital, Bhavnagar.*
- *Saudi J Pathol Microbiol, 6(10), 386-389. Brown, A., & Smith, H. (2014). Benson's Microbiological Applications, Laboratory Manual* in General Microbiology, Short Version. McGraw-Hill Education.

Course Title: Advanced Surgical Instruments (Practical)

Course Code: MOA205

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On successful completion of this course, the students will be able to

1. Classify and categorize advanced surgical instruments based on their functions, design, and specific surgical specialties.
2. Identify and differentiate advanced surgical instruments accurately, including those used in specialized procedures.
3. Demonstrate advanced techniques for handling, manipulating, and passing surgical instruments with precision.
4. Apply advanced surgical instrument techniques in complex surgical procedures, including delicate dissections, suturing, and tissue manipulation.

Course Contents

List of Experiments/Practical's

1. Instrument used for preparing surgical Cheatle forceps, Rampley sponge holding forceps, Mayo's towel clip, Esmarch bandage, simple tourniquet, Pneumatic tourniquet.
2. Care and washing sterilization and maintenance of endoscopic instruments,
3. Laparoscopic instruments, orthopedic power instruments, advanced OT tables and their attachments.
4. Types settings and use of: Image intensifier portable X-Ray machine,
5. Cautery machine, suction machine, pulse oximeter, cardiac monitor**.**
6. Wound management: scissors and its types, sucking material and techniques,
7. disinfectants and irritant dressing procedures, different types of bandages, surgical needle and needle holders, various types of suture material

Transaction Mode-

Video based teaching, collaborative teaching, case based teaching, question

Suggested Readings

- *Morgan, G. E., Mikhail, M. S., & Murray, M. J. (2002). Clinical anesthesiology (No. RD 81. M67 2002). Butterworth,*
- *J. F., Mackey, D. C., & Wasnick, J. D. (2018). Morgan and Mikhail's clinical anesthesiology. McGraw-Hill Education. nGoldman, M. A. (2019). Pocket guide to the operating room.*
- *FA Davis. Kaplan, J. A. (2018). Essentials of Cardiac Anesthesia for Noncardiac Surgery E-Book: A Companion to Kaplan's Cardiac Anesthesia.*
- *Elsevier Health Sciences. Hessel II, E. A., & Egan, T. D. (2020). Michael K. Cahalan: In Celebration of His Life and Contributions to Cardiac Anesthesiology. Journal of Cardiothoracic and Vascular Anesthesia, 34(1), 12-19.*
- *Kaplan, J. A. (2016). Kaplan's Cardiac Anesthesia E-Book: In Cardiac and Noncardiac Surgery. Elsevier Health Sciences*.

Course Title: Principles of Total Quality Management
Course Code: MOA206

L	T	P	Cr.
2	0	0	2

Total Hours: 30

learning Outcomes: On successful completion of this course, the students will be able to

1. Discuss the role of leadership in promoting a culture of quality.
2. Analyze the qualities and behaviors of effective quality leaders.
3. Emphasize the importance of customer focus in TQM.
4. Analyze methods for identifying and meeting customer needs and expectations.

Course Contents

UNIT- I **05 Hours**

Lecture wise breakup Number of Lectures Evolution of Quality - Historical Perspective, Basic Concepts of Quality, Vision, Mission and Objectives of an Organization, Corporate Structure in an Organization and Role of Quality.

UNIT- II **05 Hours**

Quality Planning, Quality by Design, Quality Costs and Cost of Failure, Waste Control, How Quality Benefits Business Quality and Competitiveness in Business, Zero Defects and Continuous Improvement, Role of Leadership and Commitment in Quality Deployment, Team Building, Motivation and Rewards

UNIT- III **10 Hours**

Total Employee Empowerment, Quality Functions - Measurement,

Inspection, Testing, Calibration and Assurance Design Control and Conformity, Tolerance and Variability, PDCA Cycle, Juran Trilogy,
Crosby's 10 points and Deming's 14 Points Customers Requirements, Customer-Supplier and Chain Links, Establishing Customer Focus-Customer, Satisfaction, Measurement and Customer Retention Product Liability

UNIT- IV **10 Hours**

Total Quality Concepts and CWQC, Difference in Western And Japanese Approach of TQM, Basic Philosophy and Fundamental Models of TQM, Total Quality and Ethics Internal Politics and Total Quality Management, Quality Culture, Education and Training Implementing Total Quality Management - An Integrated System Approach Total Preventive Maintenance Self-Assessment, International/National Quality Awards: Malcolm Baldridge Award, Deming Prize, European Award, Rajeev Gandhi Award, CII Exim Award, Jamna Lal Bajaj Award, Golden Peacock Award.

Transaction Mode-

Video based teaching, collaborative teaching, case based teaching, question

Suggested Readings

- *Total Quality Management by V.S Bagad Technical Publications, First Edition, Jan 2008 Total Quality Management by S. Rajaram Dreamtech Press, First Edition, Jan 2008.*

Course Title: Microbiology and Pathology

Course Code: MOA207

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On successful completion of this course, the students will be able to

1. Perform common microbiological techniques such as staining, culturing, and microscopy.
2. Identify microorganisms using various laboratory methods, including biochemical tests and molecular techniques.
3. Explain the cellular and tissue responses to injury, including cellular adaptation and necrosis.
4. Describe the characteristics of neoplastic growth, including benign and malignant tumors.

Course Contents

UNIT-I **10 Hours**

Definition, History, Host - Microbe relationship, Safety measures in Clinical Microbiology, Glassware used in Clinical Microbiology Laboratory, Care and handling of glassware, cleaning of glassware, Equipment used in clinical Microbiology Laboratory, Care and maintenance including calibration.
Pathology Normal cell and tissue structure and function. The changes in cellular structure and function in disease. Causes of disease and its pathogenesis. Reaction of cells, tissues, organ systems. Systemic Pathology: The study of normal structure and function of various organ systems and the aetiopathogenesis. Hematology Broad outline of blood and bone marrow changes and coagulation changes in various hematologic disorders

UNIT-II **10 Hours**

Microscopy & Sterilization Microscopy, Introduction and history, Types, principle and operation mechanism of following microscopes, Light microscope, DGI, Fluorescent, Phase contrast, Electron microscope: Transmission/ Scanning, Definition, Types and principles of sterilization methods, Heat (dry heat, moist heat with special Reference to autoclave), Radiation, Filtration, Efficiency testing to various sterilizers. Broad outline of gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features in brief.

UNIT-III **15 Hours**

Antiseptics and disinfectants, Definition, Types and properties, Mode of action - Uses of various disinfectants, Precautions while using the disinfectants -

Qualities of a good disinfectant, Testing efficiency of various disinfectants, Biomedical waste management in a Medical Microbiology laboratory, Types of the waste generated – Segregation – Treatment – Disposal, General characteristics & classification of Microbes: (Bacteria &fungi), Classification of microbes with special reference to prokaryotes & eukaryotes, Morphological classification of bacteria, Bacterial anatomy (Bacterial cell structures), Growth and Nutrition of Microbes, General nutritional & other requirements of the bacteria, Classification of bacteria on the basis of their nutritional requirements, Physical conditions required for growth, Normal growth cycle of bacteria (growth curve), Types of microbial cultures: Synchronous, Static, continuous culture.

UNIT-IV **10 Hours**

Culture media Introduction, Classification of culture media (Example & Uses) solid media, liquid media, semisolid, Media, routine/synthetic/defined media, basal media, enriched, enrichment, Selective differential media, sugar fermentation media, transport media, preservation media and anaerobic culture media, Quality control in culture media, Automation in culture media preparation Aerobic & anaerobic culture methods: Concepts, Methods Used for aerobic cultures, Methods used for anaerobic cultures

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Collee, J. C., Dugmid, J. P., Fraser, A. G., &Marmion, B. P. (1996). Practical medical microbiology, Mackie and Mc Cartney. Gupte, S. (2007).*
- *Review of medical microbiology (No. Ed. 2).Jaypee Brothers Medical Publishers (P) Ltd. Mukherjee, K. L. (2013). Medical Laboratory Technology Volume 3 (Vol. Tata McGraw-Hill Education. Cheesbrough, M. (2018). District Laboratory Practice in Tropical Countries.*
- *IJMS, 1. Willey, J. M., Sherwood, L., &Woolverton, C. J. (2011). Prescott's microbiology (Vol. 7).*
- *New York: McGraw-Hill.odd and Stanford's Clinical Diagnosis and Lab Management. Atlas and Text of Haematology by Tejinder Singh Text Book on Thyroid Pathology by Geetha Jayaram nm Robbins Pathology n*
- *Text Book of Microbiology by C.P. Baveja Harper's Text book of Biochemistry*

Course Title: Transfusion Medicine

Course Code: MOA208

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On successful completion of this course, the students will be able to

1. Familiarize oneself with blood group systems, including the ABO and Rh systems, and their importance in blood compatibility.
2. Describe the principles of blood banking, including blood collection, processing, storage, and distribution.
3. Blood administration, transfusion filters, post transfusion care, Therapeutic plasma exchange
4. Provide detailed information about the medicine transfusion.

Course Contents

UNIT-I **10 Hours**

Basic immunology ABO and Rh groups Blood component therapy Infections transmitted in blood adverse reactions to transfusion of blood and components Management of Blood Bank Issue Counter, Criteria for acceptance of requisition form, inspection of blood component prior to issue. Blood administration, transfusion filters, post transfusion care, therapeutic plasma exchange Judicious use of blood; management of different types of anemia, management of bleeding patient, Neonatal transfusion,

UNIT-II **10 Hours**

Transfusion practices in surgery, Transfusion therapy for oncology and Tran's plantation patents. Hemolytic transfusion reaction immediate and delayed; immune and non-immune reaction path physiology; Clinical signs and symptoms Laboratory invigilation for HTR Tests to defect bacterial Contamination in blood, Non- hemolytic transfusion reactions Immediate and delayed, febrile reaction, allergic reaction, clinical signs and symptoms. Acute transfusion related lung injury, all immunization, Iron overload, Graft versus host disease.

UNIT-III **10 Hours**

Strategies to prevent transfusion reactions Inventory management and maintenance of blood stock. Irradiated blood components Blood substitutes Measurement of factor VIII level in FFP Measurement of

fibrinogen level in FFP Sterility test on platelet concentrates. Sterility test on Whole blood Measurement of pH and other platelet parameters. Explain the role of blood components in coagulation. Discuss the use of transfusion medicine as a therapy for coagulopathies.

UNIT-IV **15 Hours**

Discuss the issues in the use of different blood components for coagulation. Introduce factor concentrates and in many cases may be in the pharmacy and not the blood bank but part of the equation (most common ones) explain the use of blood components in immunohematology. Discuss the use of transfusion medicine as a therapy for various conditions that involve oxygen delivery. Recognize the multiple factors that contribute to the decision to transfuse. Define and discuss blood types and their place in the practice of transfusion.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings

- *Odd and Stanford's Clinical Diagnosis and Lab Management. Atlas and Text of Haematology by Tejinder Singh Text Book on Thyroid Pathology by Geetha Jayara*
- *Robbins Pathology Text Book of Microbiology by C.P. Baveja Harper's Text book of Biochemistr Annie Winkler Vice President, Reagent R&D and Medical Affairs Instrumentation Laboratory,*
- *A Werfen Company Burlington, MA Allan M. Klompas, MB, BCh, B.A.O. Mayo Clinic Rochester Rochester, MN*

Course Title: Principle of anaesthesia

Course Code: MOA209

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On successful completion of this course, the students will be able to

1. Learn the techniques "No Sensation, No Pain" to the patient who goes under the surgical procedure.
2. Apply anesthesia to patients in different way: General, Local and Regional anesthesia.
3. Use drugs and their action, duration time, anesthesia trolley and patient position.
4. Learn vaporizers - types, hazards, maintenance, filling and draining, etc.

Course Contents-

UNIT-I **10 Hours**

Medical gas supply compressed gas cylinders Color coding Cylinder valves; pin index. Gas piping system Recommendations for piping system Alarms & safety devices. Scavenging of waste anesthetic gases Anesthesia machine Hanger and yoke system Cylinder pressure gauge Pressure regulator Flow meter assembly Vaporizers - types, hazards, maintenance, filling and draining, etc.

UNIT-II **10 Hours**

Breathing system General considerations: humidity & heat Common components - connectors, adaptors, reservoir bags. Capnography Pulse oximetry Methods of humidification. Classification of breathing system Mapleson system - a b c d e f Jackson Rees system, Bain circuit Non rebreathing valves - Ambu valves The circle system

UNIT-III **10 Hours**

Face masks & Airway laryngoscopes Types, sizes Endotracheal tubes Types, sizes. Cuff system Fixing, removing and inflating cuff, checking tube position, complications.

UNIT-IV **15 Hours**

Anesthesia ventilator and working principles Monitoring Electrocardiography (ECG) Pulse oximetry (Sp02) Temperature- central and peripheral End tidal carbon dioxide (EtCO2) Anesthesia gas monitoring Non-invasive blood pressure (NIPB) and Invasive blood pressure (IBP) Central venous pressure (CVP) PA Pressure, LA Pressure & cardiac output Anesthesia depth monitor neuromuscular transmission monitor.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question, ppt.

Suggested Readings:

- *Chestnut, D. H., Wong, C. A., Tsen, L. C., Kee, W. D. N., Beilin, Y., &Mhyre, J. (2014).*
- *Chestnut's obstetric anesthesia: principles and practice e- book. Elsevier Health Sciences Miller, R. D., Eriksson, L. I., Fleisher, L. A., Wiener-Kronish, J. P., Cohen, N. H., & Young, W. L. (2014).*
- *Miller's anesthesia e- book. Elsevier Health Sciences Hemming s, H. C., & Egan, T. D. (2012). Pharmacology and Physiology for Anesthesia E-*

Course Title: Transfusion Medicine

Course Code: MOA210

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes: On successful completion of this course, the learner will be able to

1. Study about IV Fluids & Blood Transfusion.
2. Know about Transportation of Patient.
3. Know about OT preparation for special cases.
4. Study about various diagnostic examinations done for surgical Patient

Course Contents-

UNIT-I **10 Hours**

Historical background and development of transfusion medicine, Blood banking and transfusion services, Blood components and their preparation Blood groups, antigens, and antibodies, Blood typing and cross-matching techniques
Blood collection, testing, and labeling procedures, Quality control and regulatory aspects of transfusion medicine.

UNIT-II **10 Hours**

ABO and Rh blood group systems and their clinical significance, Other blood group systems (e.g., Kell, Duffy, Kidd), Alloantibodies and their detection in patient and donor samples, Compatibility testing, including major and minor cross-matching
Hemolytic disease of the fetus and newborn (HDFN), Transfusion reactions and their management

UNIT-III **10 Hours**

Preparation, storage, and indications for various blood components (red cells, platelets, plasma, cryoprecipitate), Blood product processing techniques (leukoreduction, irradiation, washing), Special transfusion considerations (pediatric transfusion, massive transfusion, emergency situations), Transfusion therapy for specific patient populations (obstetrics, oncology, surgery), Transfusion-related infections and their prevention

UNIT-IV **15 Hours**

Hemapheresis procedures (therapeutic apheresis, stem cell collection), Transfusion support in hematopoietic stem cell transplantation, Transfusion-

transmitted diseases and screening strategies, Emerging technologies and advancements in transfusion medicine, Research methodologies and evidence-based practice in transfusion medicine
Ethical, legal, and regulatory aspects of blood transfusion

Transactional modes
Video based teaching, Collaborative teaching, Case based teaching, Question, ppt.

Suggested Readings:

- *Ajay Yadav and Arora Synopsis of medical Jaypee instruments Pramila Bhalla Operation room technician's APH M.P. Sharma Operation Theatre Techniques AITBS Publishers&Management.*
- *M.A. Goldman Pocket Guide to Operating JAYPEE.*

Course Title: Research Methodology

Course Code: MOA301

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes: On successful completion of this course, the students will be able to:

1. Prioritize the needs of research in the clinical field of Radiology.
2. Choose the appropriate research design and develop appropriate research hypothesis for a research project.
3. Describe the appropriate statistical methods required for a particular research design.
4. Develop the ability to apply the methods while working on a research project work.

Course Contents

UNIT-I **15 Hours**

Research: its concept, nature, scope, need and Objectives of Research, Research types, Research methodology, Research process – Flow chart, description of various steps, Selection of research problem.

UNIT-II **15 Hours**

Research Design: Meaning, Objectives and Strategies of research, different research designs, important experimental designs, Methods of Data Collection and Presentation: Types of data collection and classification,

Observation method, Interview Method, Collection of data through Questionnaires, Schedules, data analysis and interpretation, editing, coding, content analysis and tabulation.

UNIT-III **15 Hours**

Sampling Methods: Different methods of Sampling: Probability Sampling methods, Random Sampling,
Systematic Sampling, Stratified Sampling, Cluster Sampling and Multistage Sampling. Non probability Sampling methods, Sample size.

UNIT-IV **15 Hours**

Report writing and Presentation: Types of reports, Report Format – Cover page, Introductory page, Text, Bibliography, Appendices, Typing instructions, Oral Presentation

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question, ppt.

Suggested Readings:

- *Panneerselvam, R , 'Research Methodology', PHI, New Delhi.*
- *Cooper, D.R.,Schindler,P.S., 'Business Research Methods,' Tata McGraw Hill Gupta S P,' Statistical Methods', Sultan Chand & Sons, Delhi Ronald E Walpole, 'Probability and Statistics for Engineers and Scientists'*
- *(International Edition) , Pearson Education. Geode, Millian J. & Paul K. Hatl, "Methods in Research", McGraw Hills, New Delhi.*

Reference Books:

- *Kothari C.R., "Research Methodology", New Age Publisher Nargundkar R, Marketing Research, Tata McGraw Hill, New Delhi, 2002.*
- *Sekran, Uma, "Business Research Method", Miley Education, Singapore.*

Website/Links/Online Portal/ICT

- *https://www.academia.edu/*
- *https://www.studeersnel.nl*
- *https://www.scribd.com*

Course Title: Research Proposal

Course Code: MOA302

L	T	P	Cr.
2	0	4	4

Total Hours: 60

Learning Outcomes: On successful completion of this course, the students will be able to

1. Identify and explain the key components of a research proposal, including the research question, objectives, literature review, methodology, and timeline.
2. Choose an appropriate research topic or research question based on personal interests, academic relevance, and research gaps.
3. Describe the data collection methods (e.g., surveys, interviews, experiments) and instruments to be used in the study.
4. Identify the resources (e.g., funding, equipment, access to participants) needed to conduct the research.

Course Contents

UNIT-I **10 Hours**

Research Methodology Introduction to research methods identifying research problem Ethical issues in research design

UNIT-II **15 Hours**

Data Collection Experimental and non-experimental research designs Sampling methods, data collection, observation methods Interview method, questionaries' and schedules construction

UNIT-III **15 Hours**

Research Frame Work Ethical issues in research Principles and concepts in research ethics-confidentiality and privacy informed consent writing research proposals Development of conceptual framework in research

UNIT-IV **20 Hours**

Rationale Basic principles of research and methods applied to draw inferences from the research findings. Measures of Dispersion, Skewness and kurtosis, Sampling, Sample size determination, Introduction and method of collecting and presenting statistical data. Calculation and interpretation of various measures like mean, median, standard deviations, Skewness and Kurtosis, Probability distribution, Correlation and regression Significance tests and confidence intervals

List of Experiment/Practical

1. Understanding the purpose and importance of a research proposal Identifying research topics and formulating research questions.
2. Reviewing relevant literature and conducting a literature search, Ethical considerations in research proposal development.
3. Research Design and Methodology, selecting appropriate research designs (quantitative, qualitative, mixed methods).
4. Sampling techniques and sample size determination, Data collection methods (surveys, interviews, observations, and experiments), Instrument development and validation.
5. Data analysis techniques and statistical considerations.
6. Components of a Research Proposal, Title and abstract writing, Introduction and background section.
7. Research objectives and hypotheses, Methodology and study design, Data analysis plan and statistical considerations, Timeline and budget development.
8. Refining and Presenting the Research Proposal, Peer review and feedback process.
9. Revision and refinement of the research proposal, Oral presentation skills for research proposals.
10. Finalizing the research proposal and preparing it for submission, Funding opportunities and grant writing basics,.
11. Ethical Considerations and Institutional Review Boards (IRBs)
12. Understanding ethical guidelines for research involving human subjects.
13. Writing an IRB application and addressing ethical concerns
14. Presenting the research proposal to an audience and defending its merits.
15. Incorporating feedback and finalizing the research proposal

Transaction Mode-

Video based teaching, collaborative teaching, case based teaching, question

Suggested Readings

- *Kothari, Chakravanti Rajagopalachari. Research methodology: Methods and techniques. New Age International, 2004. Mahajan, B. K., &Lal, S. (1999).*
- *Methods in biostatistics for medical students and research workers.Indian Journal of Community Medicine, 24(3), 140. Spiegel, M. R., Schiller, J. J., &Srinivasan, R. A. (2013)*
- *.Schaum's outline of probability and statistics. McGraw-Hill Education.*

Course Title: Ethics & IPR

Course Code: MOA303

L	T	P	Cr.
2	0	0	2

Total Hours: 30

Learning Outcomes: On successful completion of this course, the students will be able to:

1. Explain different kind of ethics and values.
2. Apply professional ethics in business.
3. Explain the role of IPRs in professional life.
4. Elucidate the importance of patents and copyrights.

Course Contents

UNIT-I **07 Hours**

Ethics: definition, moral philosophy, nature of moral judgments and reactions, scope, Ethics with respect to science and research, Intellectual honesty and research integrity scientific misconducts:

UNIT-II **08 Hours**

Falsification, Fabrication, and Plagiarism (FFP) Redundant publications: duplicate and overlapping publications, salami slicing, Selective reporting and Misrepresentation of data, Publication ethics: definition, introduction and importance.

UNIT-III **08 Hours**

Introduction to Intellectual Property rights: Concept & theories, Kinds of intellectual Property Rights, Advantages & Disadvantages of IPR, Development of IPR in India, Role & Liabilities of IPRs in India.

UNIT-IV **07 Hours**

Rights of trademark-kind of signs used as trademark-types, purpose & Functions of a trademark, trademark protection, trademark registration, selecting and evaluating trade mark, trade mark registration process.

Transaction Mode-

Video based teaching, collaborative teaching, case based teaching, question

Suggested Readings

- *harles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, (1999).*

- *John R Boatright, "Ethics and the Conduct of Business", Pearson Education,*
- *(2003)*
- *Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethic forScientists and Engineers", Oxford University Press, (2001)*
- *Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, (2004)*
- *David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press, (2003)*

Course Title: Proficiency in Teaching

Course Code: MOA304

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On successful completion of this course, the students will be able to:

1. Design and develop learner-centered instructional plans and learning outcomes.
2. Apply innovative teaching strategies and technologies to engage learners.
3. Explore different assessment methods to evaluate student learning.
4. Reflect on teaching experiences and continuously improve teaching practices.
5. Develop effective communication and classroom management skills.

Course Content

UNIT I **15 Hours**

Overview of the course and its objectives - Theories of learning and their implications for teaching - Understanding the role of the teacher and student in the learning process -Writing clear and measurable learning outcomes - Meaning Nature, definition, scope and importance Pedagogy, Andragogy and Heutagogy – Skills based approach to teaching (Teaching skills), Micro-teaching, Macro teaching. Methods and approaches of teaching - CAM, Structure function approach, Synthetic and Analytic approach, and Jurisprudential enquiry model

UNIT I **15 Hours**

Understanding the diverse needs and backgrounds of learners - Creating an inclusive and supportive learning environment - Facilitating active learning and student engagement strategies Lectures, discussions, and demonstrations - Group work, collaborative learning, and cooperative learning - Problem-based learning, case studies, and simulations

UNIT III **15 Hours**

Integrating technology tools into instruction – Online, blended learning, flipped learning and M-learning approaches - Using educational software and platforms effectively Formative and summative assessment methods – Difference between Assessment, Evaluation and Measurement, E-assessment tools,

UNIT IV **15 Hours**

The importance of reflective practice in teaching - Self-assessment and evaluation of teaching effectiveness – Need of Professional development - Teaching in multicultural and international classrooms - Culturally responsive teaching practices Meaning, Definition of teaching model, Assumptions, Importance, Role and type of teaching models. Historical teaching model, Philosophical model of teaching

TRANSACTION MODE

Discussions, Case Studies, Microteaching, Classroom Observations, Peer Teaching: Video
Analysis, Role-Playing, Teaching Demonstrations, Classroom Simulations, Reflective
Journals/Blogs, Teaching Portfolios and Technology Integration

SUGGESTED READINGS

- *Das, R.C. (1993): Educational Technology – A Basic Text, Sterling Publishers Pvt. Ltd. Evaut, M. The International Encyclopaedia of Educational Technology.*
- *Graeme, K. (1969): Blackboard to Computers: A Guide to Educational Aids, London, Ward Lock. Haas, K.B. and Packer, H.Q. (1990): Preparation and Use of Audio Visual Aids, 3rd Edition, Prentice Hall, Inc Haseen Taj (2006):modern Educational Technology,Agra : H.P Bhargava Book House.*
- *Kumar, K.L. (2008): Educational Technology, New Age International Pvt. Ltd. Publishers, New Delhi (Second Revised Edition). Mukhopadhyay, M. (1990): Educational Technology – Year Book 1988, All India Association for Educational Technology, New Delhi.*
- *Bruce R Joyce and Marsha Weil, Models of Teaching, Prentice Hall of India Pvt Ltd, 1985. Gage N L , Hand book of Research on Teaching, Rand Mc Naly and Co., Chicago, 1968.*
- *Sharma R A, Technology of Teaching, International Publishing House, Meerut, 1988. Siddiqui M S., and Khan M S., Models of Teaching – Theory and Research, Manas Publication, New Delhi, 1991*

Course Title: Service learning

Course Code: MOA305

L	T	P	Cr.
0	0	4	2

Total Hours: 30

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

1. Preparing for an operation and maintenance of Operation Theatre and its equipment's.
2. Assist the surgical team during operation.
3. Provides support to patients in the recovery room.

4. Equipment care and maintenance.

Course Title: Computer Lab

Course Code: MOA306

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes: On successful completion of this course, the students will be able to:

1. Understand the concepts of computer system, Windows operating system, Internet, various storage devices and computer Networks, e-waste
2. Analyze various components and Input output devices used in a computer system.
3. Utilize various applications and software's used
4. Creating and manipulating presentation, views, and formatting and enhancing text, and slide with graphs

Course Contents

UNIT-I **05 Hours**

Generating Charts/Graphs in Microsoft Excel, Power Point Presentation, Creating a new document with templates & Wizard, Word basics, Thesis Writing Formats & scientific editing tools. Style Formats (MLA & APA)

UNIT-I **05 Hours**

Using Words Drawing Features, Inserting Tables – (Adding, deleting, modifying rows and columns - merging & splitting cells), Using formulas in tables, Converting text to table and vice-versa, Mail Merge tool. Managing Workbooks, Working with Worksheets.

UNIT-III **10 Hours**

Introduction of Windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resize minimizing and maximizing, etc.). Introduction to MS- Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

UNIT-IV **10 Hours**

Introduction to Excel: introduction, about worksheet, entering information, saving. Introduction of Operating System: introduction, operating system

concepts, types of operating system. Computer Networks: introduction, types of network (LAN, MAN, WAN, Internet,
Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

Transaction Mode-
Video based teaching, collaborative teaching, case based teaching, question

Text Books:

- *Leon & Leon, "Introduction to Computers", Vikas Publishing House, New Delhi Saxena S., "*
- *MS Office Xp for Everyone", Vikas Publishing House, New Delhi, 2007 June Jamrich Parsons, "Computer Concepts", Thomson Learning, 7th Edition, Bombay*

Reference Books:

- *White, "Data Communications & Computer Network", Thomson Learning, Bombay Comer, "Computer networks and Internet", Pearson Education, 4eRajaraman, V., &Radhakrishnan, T. (2006).*
- *Digital Logic and Computer Organization. PHI Learning Pvt. Ltd..Mehdi, M. M. (2015). Information Technology for Management by. FIIBBusiness Review, 4(1), 46-47.Ram, B. (2000).*
- *Computer fundamentals: architecture and organization. New Age International.Basandara, S. K. (2017).*
- *Computers Today ,Galgotia publication PvtLtd. Daryaganj, New Delhi. MSadagopan, S. (1998).*
- *Internet for everyone by Alexis Leon and Matthews Leon, Vikas Publishing House, 1997, Rs. 128.00.Saxena, S. (2009).*
- *A first course in computers: Based on Windows Xp& Office. Vikas Publishing House Pvt Ltd. Sinha P.K. and Sinha, P. (2007)*
- *Computer Fundamentals,BPB Publications. Bangia, R. (2008). Computer Fundamentals and Information Technology. Firewall Media.*

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https://www.researchgate.nethttps://www.youtube.com/playlist?list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp

Course Title: Professional Training/ Internship

Course Code: MOA401

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0	0	0	20

Research Project

Students have to carry out a Research Project (on any topic related to Operation Theatre and Anesthesia) under the supervision of a Surgeon or Doctor. The Research Project has to be prepared on the basis of the research work carried out. The assessment is done on the basis of the work done and the presentation and viva.