

# **2<sup>nd</sup> Semester**

**PRINCIPLES OF ANESTHESIA**

**Subject Code:MAOTS1-201**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** A primary purpose of the course is to know about uses of basic anesthetic instruments, basic anesthetic procedure and anesthetic drugs.

**Course Syllabus:**

**UNIT-I**

**10 Hours**

History of anesthesia; Pre-operative preparation of patient; care of emergency patients; Types of Anesthesia; inhalational agents; I.V Anesthetic drugs; Pre-anesthetic Management; Post-operative Management. Types of fluids/blood components; Electrolyte balance

**UNIT-II**

**10 Hours**

Anesthesia machine and equipment's: Work Station, Induction, Endotracheal Tubes, Airways Maintenance of anesthesia, Positioning of the patient

**UNIT-III**

**10 Hours**

Medical gas supply: Compressed gas cylinders; Color coding; Cylinder valves; pin index; Gas piping system; Recommendations for piping system; Alarms & safety devices.

**UNIT-IV**

**10 Hours**

Anesthesia machine: Hanger and yoke system; Cylinder pressure gauge; Pressure regulator; Flow meter assembly; Vaporizers - types, hazards, filling and draining

**UNIT-V**

**10 Hours**

Breathing system, General considerations; Common components ;connectors, adaptors, reservoir bags, Face masks ; ETCO<sub>2</sub>, Methods of humidification, Classification of breathing system, Non rebreathing valves - Ambu bag, Soda lime, indicators, airways.

**UNIT-VI**

**10 Hours**

Monitoring; ECG ; SpO<sub>2</sub> ; Temperature; IBP ; CVP ; PA Pressure ; LA Pressure, Capnography, Blood Gas Analysis, Pulse Oximetry, Central nervous system monitoring, Neuromuscular monitoring, Blood loss monitoring

**Suggestive Readings**

**Text Books:**

- Textbook-Anaesthesia by G. Smith & A.R. Aitkehead March, ELSEVIOR
- Short text book of anaesthesia by Ajay Yadav, JP Brothers

**Reference Books:**

- Textbook-Anaesthesia by Pramod Kumar, ELSEVIOR
- Equipment-Drugs-Waveforms-Anaesthesia-Practical by P. Kumar, JP Brothers

**SURGICAL TOOLS AND TECHNIQUES**

**Subject Code: MAOTS1-202**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** In this course to study about the structure of the operation theater, how to prepare the surgical team, surgical instruments and surgical procedure.

**Course Syllabus:**

**UNIT- I**

**10 Hours**

Sterilization & disinfections, Principles of autoclaving, Fumigation of O.T, Cleaning and care of surgical instruments, ventilation of operating room, positions of O.T Table, operating area illumination, types of operating departments.

**UNIT- II**

**10 Hours**

General surgical principles & instruments, preparation of surgical patient, operation room size and ventilation, Cleaning of O.T, preparation of surgical instruments trolley, preparation of laparoscopic instruments; cleaning and care of laparoscopic instruments

**UNIT- III**

**15 Hours**

Incision and its types, instruments used for general surgery, orthopedic surgical instruments, Genecology procedure instruments major abdominal incision, minor surgical procedure instruments , E.N.T surgical instruments, Neurological instruments

**UNIT-IV**

**10 Hours**

Wound management, sucking material & techniques, disinfectants, dressing procedure, different types of bandages, Abscess Drainage

**UNIT- V**

**15 Hours**

Positioning/Types of positions for surgery, Care of ICU patient, Preparation of patient for surgery, Suture Materials, Drains, Catheters, Drip Sets, Bags, Miscellaneous Operation table and its types, Diathermy machine and its working, O.T Lights and its types , Suction machine and its principle , Types jars, Suction tubes,

**Suggestive Readings:**

**Text- Books**

- Synopsis of medical instruments by Ajay and Yadav, Jaypee
- Basic Surgical Techniques by Raymond Maurice Kirk, ELSEVIOR

**Reference Books:**

- Manual of Surgery by Alexis Thomson, Alexander Miles; Morrison and Gibb
- Surgical instruments by Ajay Kumar Agarwal and Neela Bhaarwal, Jaypee

**ANATOMY & PHYSIOLOGY -II**

**Subject Code:MAOTS1-203**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** In this course to study about the internal structure of human body

**Course Syllabus:**

**UNIT – I**

**10 Hours**

Introduction to human body: Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology. Cellular level of organization: Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular pathway activation by extracellular signal molecule. Tissue level of organization: Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.

**UNIT – II**

**10 Hours**

Integumentary system: Structure and functions of skin. Skeletal system: Divisions of skeletal system, types of bone, salient features and functions of bones. Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction. Joints: Structural and functional classification, types of joints movements and its articulation.

**UNIT – III**

**10 Hours**

Alimentary system: mechanism and physiology of digestion and absorption structure & function (Mouth, Tongue, Teeth, Oesophagus, Pharynx, Stomach, Intestine, Rectum, Anus; Digestive, structure and function of liver. Urinary system: Main parts, Structure & function of kidney, structure of nephron, physiology of excretion & urine formation, urine, additional excretory organs.

**UNIT – IV**

**10 Hours**

Nervous system: Organization of nervous system, neuron, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters. Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. Structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity). Peripheral nervous system: Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves. Special senses: Structure and functions of eye, ear, nose and tongue and their disorders.

**UNIT – V**

**10 Hours**

Endocrine system : Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders. Circulatory system: Composition and functions of blood, anatomy and physiology of Heart, circulation of blood, cardiac cycle and conducting system of Heart, the blood pressure, arteries and veins. Respiratory system- Organs of respiration and their

histology, Respiration (definition and mechanism), Gas exchange in the lungs, Regulation of respiration, Basal metabolic rate.

#### **UNIT –VI**

**10 Hours**

Reproductive system-Male and female reproductive system, Histology of gonads, the ovarian cycle and ovulation, Fertilization, spermatogenesis. Lymphatic system- Introduction, Structure and function, Lymph nodes, Spleen, Thymus gland, Tonsils. Body fluids and their significance: Important terms, types of body fluid, total body water, avenues by which water leaves and enters body, general principles for fluid balance, cardinal principle, how body fluids maintain Homeostasis, Electrolytes & ions Function of electrolytes, how electrolyte imbalance leads to fluid imbalance.

#### **Recommended Books:**

##### **Text- Books:**

- Basic Anatomy and Physiology by N Muruges, Sathya
- Anatomy and Physiology by Anne Waugh and Kathleen JW Wilson; Curchill Living Stone; London, Ross and Wilson

##### **Reference Books:**

- Anatomy and Physiology by Pears, JP Brothers
- Anatomy and Physiology by Sears, ELBS

**PRINCIPLES OF HOSPITAL PRACTICES**

**Subject Code: MAOTS1-204**

**L T P C**  
**3 0 0 3**

**Duration: 45 Hours**

**Course Objectives:** 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.

**Course Syllabus:**

**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 and stock-taking and stock keeping.

**UNIT – II**

**10 Hours**

**Radiopharmaceuticals:** Introduction to Radio pharmaceuticals, radio-active techniques, Radio-activity Production of radio-waves, Permissible radiation dose level, Radiation hazards and their prevention, specifications for radio-active laboratory.

**UNIT – III**

**10 Hours**

**Infection:** Bacteria, their nature and appearance; spread of infections; auto-infection or cross-infection; the inflammatory process; local tissue reaction, general body reaction; ulceration; asepsis and antisepsis.

**UNIT – IV**

**15 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, supports etc. shock; insensibility; asphyxia; convulsions; resuscitation, use of suction apparatus, drug reactions; prophylactic measures; administration of oxygen; electric shock; burns; scalds; hemorrhage; pressure points; compression band, fractures; splints, bandaging; dressing, foreign bodies; poisons.

**Suggestive Readings:**

**Text- Books**

- A Textbook of hospital pharmacy by Nand and Khar, JP publications.

**Reference Books:**

- Handbook of Radiopharmaceuticals by Owunwonne, Narosa Publishing New Delhi

**IMMUNOLOGY & PATHOLOGY**

**Subject Code:MAOTS1-205**

**L T P C**  
**3 0 0 3**

**Duration: 45 Hours**

**Course Objectives:** This course has been formulated to impart basic immunologic techniques and their utility in laboratory diagnosis of human diseases. The student will study diseases associated with different body organs and systems.

**Course Syllabus:**

**UNIT-I**

**10 Hours**

**Immunology Serological Test**

Antigen antibody interaction

Principle, procedure and applications of Complement fixation test, Immunofluorescence, ELISA, CCIEP, and RIA, SDS-PAGE and western blotting in Medical Microbiology

**UNIT-II**

**10 Hours**

**Cell Injury and Adaptation**

Causes of cell injury. Mechanism of cell injury, ischemia & hypoxic injury, chemical injury, reversible injury, necrosis, cellular adaptation of growth & Differentiation atrophy, hypertrophy, metaplasia, hyperplasia, classification of tumors , premalignant lesion, diagnosis of cancer.

**UNIT-III**

**15 Hours**

**The Haematophotic And Lymphoid System**

Hemorrhage. various type of Anemia, leucopenia, leukocytosis, bleeding disorders coagulation mechanism , maintenance of blood volume. Abnormalities of pH of blood.

**Disorders of Vascular Flow And Shock**

Oedema, hyperemia or congestion, thrombosis, embolism. Infarction shock, Ischemia, Over hydration, dehydration.

**UNIT-IV**

**10 Hours**

**The Skeletal System**

Pathogenesis of common diseases of bones, Joints & Muscles

Cardiopulmonary system, Pathogenesis of the various diseases of the heart and lungs.

**Suggestive Readings:**

**Text- Books**

- A Textbook of Microbiology by Ananthanereyan and Panikergy, Universities Press.
- A Textbook of Microbiology by Michael J. Pelczar, JR. E.C.S Chan & Noel R. Krieglogy, Tata McGraw Hill.

**Reference Books:**

- A Textbook of Pathology by D.R Imtyazwani, Pee Vee (PV).
- A Textbook of Pathology by Harsh mohan, Universities Press

**SURGICAL EQUIPMENT & ANESTHESIA TECHNOLOGY LABORATORY**

**Subject Code:MAOTS1-206**

**L T P C  
0 0 4 2**

**4 Hour /Week**

**Course Objectives:** In this course to study about the structure of the operation theater, how to prepare the surgical team, surgical instruments and surgical procedure. Moreover know about correct uses of different types of surgical instrument in surgery.

**Course Syllabus:**

1. Sterilization and fumigation of OT.
2. Preparation of patient in OT.
3. Various methods of sterilization.
4. Identification of General set and others sets of instruments,
5. Practical work conducting as per that theory syllabus of surgical and anesthesia technology.

**Suggestive Readings:**

**Text- Books**

- Synopsis of medical instruments by ajayjadav and arora, Jaypee
- Basic Surgical Techniques by Raymond Maurice Kirk, ELSEVIER

**Reference Books:**

- Manual of Surgery by Alexis Thomson, Alexander Miles, Morrison and Gibb
- Surgical instruments by Ajay kumar Agarwal and Neela Bhaarwal, Jaypee

**ANATOMY AND PHYSIOLOGY LABORATORY- II**

**Subject Code:MAOTS1-207**

**L T P C  
0 0 4 2**

**4 Hour /Week**

**Course Objectives:** The objective of this course is to develop a basic understanding about the structure and functions of the human body and body organs.

**Course Syllabus:**

- 1) To study the integumentary system
- 2) Identification of axial bones
- 3) Identification of appendicular bones



- 4) To study the special senses using specimen, models, etc.
- 5) To study the nervous system using specimen, models, etc.
- 6) To study the endocrine system using specimen, models, etc
- 7) To demonstrate the function of olfactory nerve
- 8) To examine the different types of taste.
- 9) To demonstrate the reflex activity
- 10) Recording of body temperature
- 11) To demonstrate positive and negative feedback mechanism.
- 12) Determination of bleeding time
- 13) Determination of clotting time.
- 14) Identification of Various Organs in the human Body: Liver, Heart, Kidney, Nephron, Lungs, Neuron, Ovary and etc.

# 3<sup>rd</sup> Semester

**GENERAL MEDICINES RELEVANT TO ANESTHESIA**

**Subject Code:MAOTS1-301**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** This course has been formulated to impart basic knowledge about general medicine

**Course Syllabus:**

**UNIT-I**

**15 Hours**

INHALATIONAL ANESTHETIC AGENTS, General aspects of inhalational agents, agents used for inhalation, systemic effect of inhalational agents, salient features of Agents, mechanism of action of inhalation agents.

**UNIT-II**

**15 Hours**

INTRAVENOUS ANAESTHETIC AGENTS

Classification of I.V agents, Thiopentone sodium, Propofol, Ketamine, Midazolam, Etomidate, opioids, Benzodiazepines.

**UNIT-III**

**15 Hours**

NEUROMUSCULAR BLOCKING AGENTS

Classification of neuromuscular blocks, physiology of neuromuscular transmission, mechanism of neuromuscular blocks, Antagonism of neuromuscular blocks.

LOCAL ANAESTHETIC AGENTS

Classification, mechanism of action, general aspects of local anaesthetics, salient features of drugs.

**UNIT-IV**

**15 Hours**

Analgesics, Opioids, classification of opioids, mechanism of opioids, non-steroidal anti-inflammatory drugs, Non-specific COX inhibitors.

**Suggested readings**

**Text Books:**

- Text book of Anaesthesia by Manjushree Ray, Enakshi Saha; Universities Press.
- Text book of Anaesthesia by B. K. Mahajan

**References Books:**

- Text book of Anaesthesia by R Kishan, Universities Press.
- Text book of Anaesthesia by Ajay Morgan, Tata McGraw Hill.

**SURGICAL PROCEDURES WITH ANESTHESIA**

**Subject Code:MAOTS1-302**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** To study about the surgical procedures and anesthesia.

**Course Syllabus:**

**UNIT-I**

**12 Hours**

Anesthesia for Cardiovascular Disease ,Systemic hypertension, Ischemic heart disease, Volvular heart disease, Congenital heart disease, Congestive cardiac failure, anesthesia management during cardiac surgery .

**UNIT-II**

**12 Hours**

**ANAESTHESIA FOR RESPIRATORY DISEASE,** Obstructive airway disease, Restrictive lung disease, postoperative pulmonary complication, thoracic surgery,

**UNIT-III**

**12 Hours**

Anesthesia for orthopedic disease, Rheumatoid disease, Ankylosing spondylitis, Excessive Hemorrhage, Deep Vein thrombosis, Fractures, Total knee replacement,

**UNIT-IV**

**12 Hours**

Anesthesia for neurosurgery and urogenital disease myasthenic syndrome, cerebrovascular disease, seizure disorder, Parkinson's disease, spinal cord injury, autonomic dysfunction, psychiatric illness, muscular dystrophy, renal dysfunction, TURP, renal function

**UNIT-V**

**12 Hours**

Anesthesia for hepatic and endocrine disease, Acute liver disease, liver function, biliary obstruction, diabetes mellitus, thyroid dysfunction, hyperthyroidism, adrenal gland.

**Suggested readings**

**Text Books:**

- Text book of Anaesthesia by Manjushree Ray, Enakshi Saha; Universities Press.
- Text book of Anaesthesia by Ajay Morgan, Tata McGraw Hill.

**References Books:**

- Text book of Anaesthesia by R Kishan, Universities Press.
- Text book of Anaesthesia by D.R Samta Yadav Pee Vee (PV)

**ANESTHETIC EQUIPMENT'S AND INSTRUMENTS**

**Subject Code:MAOTS1-303**

**L T P C**  
**3 1 0 4**

**Duration: 60 Hours**

**Course Objectives:** To know about anesthetic equipments and instruments used in anesthesia.

**Course Syllabus:**

**UNIT-I**

**12 Hours**

ANAESTHESIA EQUIPMENTS, Anesthesia machine, Gas cylinders, piped gas, pressure gauge, pressure regulator, flow control valve, flow meters, oxygen flush, pressure relief valve, vaporizers, common gas outlet.

**UNIT-II**

**12 Hours**

**BREATHING SYSTEM**

Components of a breathing system, classification of breathing system, system using for carbon dioxide absorption, re breathing system, non re breathing system, .

**UNIT-III**

**12 Hours**

Instruments, Airways, face masks, reservoir bag, laryngoscopes, LMA, E.T tubes, humidifiers, nebulizers,

**UNIT-IV**

**12 Hours**

Monitors, Types of monitors, Clinical monitoring, instrumental monitoring, advanced monitors, ventilators, infusion pumps

**UNIT-V**

**12 Hours**

Equipments for regional anaesthesia, Equipments used for central neuraxial blocks, equipments used for peripheral blocks.

**Suggested readings**

**Text Books:**

- Text book of Anaesthesia by Manjushree Ray, Enakshi Saha; Universities Press.
- Text book of Anaesthesia by Ajay Morgan, Tata McGraw Hill.

**References Books:**

- Text book of Anaesthesia by R Kishan, Universities Press.
- Text book of Anaesthesia by D.R Samta Yadav Pee Vee (PV)

**ADVANCED SURGICAL INSTRUMENTS**

**Subject Code:MAOTS1-304**

**L T P C**  
**3 0 0 3**

**Duration: 45 Hours**

**Course Objectives:** To study about the advanced surgical instruments used for surgeries.

**Course Syllabus:**

**UNIT-I**

**10 Marks**

Advanced instrumentation techniques, Elective surgery equipments, General equipments, Mastectomy instruments, Laparotomy instruments, Hernioplasty instruments.

**UNIT-II**

**10 Hours**

Thyroidectomy instruments, parathyroidectomy, electrical instruments, laser instruments, Ultrasonic equipments.

**UNIT-III**

**8 Hours**

Operating Microscopes, Endoscopy equipments, Ligature and suture material, Gynecological and obstetric instruments, Urological instruments, Endocrine surgical equipments.

**UNIT- IV**

**7 Hours**

Orthopedic instruments, ophthalmic instruments, ENT instruments, Neurosurgical instruments, Plastic surgery instruments, Thoracic surgery instruments, Cardiovascular instruments, Pediatric surgery instruments

**UNIT- V**

**5 Hours**

Management of operating room, Operating table, Care and preparation of OT, Infection control, Sterilization and its types, Sterilization of surgical instruments and OT, Care and preparation of surgical instruments

**UNIT-VI**

**5 Hours**

Anaesthesia for neurosurgery and urogenital disease; Myasthenic syndrome, cerebrovascular disease, seizure disorder, parkinsons disease, spinal cord injurey, autonomic dysfunction, psychiatric illness, muscular dystrophy, renal dysfunction, TURP, renal function.

**Suggested readings**

**Text Books:**

- Text book of Surgical Instruments (4<sup>th</sup> Edition) by Maryann papanier wells, Elivezers publizers.
- Text book of Surgical Instruments by Nancy marie H., Nancy marie Phillips.

**PRINCIPLES OF TOTAL QUALITY MANAGEMENT**

Subject Code: MAOTS1-305

L T P C  
1 0 0 1

Duration: 15 Hours

**Course Objectives:** To give the students an overview of quality and TQM and explaining the salient contributions of Quality Gurus like Deming, Juran and Crosby. General barriers in implementing TQM.

**Course Syllabus:**

**UNIT I**

**5 Hours**

**Introduction** - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements.

**UNIT II**

**5 Hours**

**TQM PRINCIPLES:** Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle.

**UNIT III**

**5 Hours**

**TQM TOOLS & TECHNIQUES:** The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types.

**Suggested readings**

**Text Books:**

- Total Quality Management: Key Concepts and Case Studies by D. R Kiran
- Total Quality Management in education by Dongbin Yang
- Total Quality Management revised third edition dale h. besterfield

**ADVANCED SURGICAL AND ANESTHESIA LABORATORY**

**Subject Code:MAOTS1-306**

**L T P C**  
**0 0 4 2**

**4 Hour /Week**

**Course Objectives:** This course has been formulated to impart basic immunologic techniques and their utility in laboratory diagnosis of human diseases. The student will study diseases associated with different body organs and systems.

**Course Syllabus:**

1. Preparation of cardiac surgery and its instruments.
2. Preparation of cardiac patient for surgery.
3. Preparation and sterilization of laparoscopic instruments.
4. General surgical instruments use and care.
5. Preparation of orthopaedic instruments and their use, care
6. Auto calving and cleaning of anaesthesia equipments.

**Suggested readings**

**Text Books:**

- Text book of Anaesthesia by Manjushree Ray, Enakshi Saha; Universities Press.
- Text book of Anaesthesia by Ajay Morgan, Tata McGraw Hill.

**References Books:**

- Text book of Anaesthesia by R Kishan, Universities Press.
- Text book of Anaesthesia by D.R Samta Yadav Pee Vee (PV)

**ANAESTHETIC EQUIPMENTS LABORATORY**

**Subject Code:MAOTS1-307**

**L T P C**  
**0 0 4 2**

**4 Hour /Week**

**Course Objectives:** To know about the advance surgical equipments used for surgery

**Course Syllabus:**

- 1) Preparation and care of laparoscopic equipments.
- 2) Preparation and demonstration of operation theatre.
- 3) Preparation of pre and post-operative words.
- 4) Care and monitoring of ICU patients.



- 5) Autoclaving and cleaning of ICU, RICU, PICCU Words.
- 6) General surgical instruments use and care.
- 7) Preparation and care of orthopaedic instruments.
- 8) Autoclaving and cleaning of anaesthesia equipments.

**Suggested readings**

**Text Books:**

- Text book of Anaesthesia by Manjushree Ray, Enakshi Saha; Universities Press.
- Text book of Anaesthesia by Ajay Morgan, Tata McGraw Hill.

**References Books:**

- Text book of Anaesthesia by R Kishan, Universities Press.
- Text book of Anaesthesia by D.R Samta Yadav Pee Vee (PV)

# 4<sup>th</sup> Semester

**INTERNSHIP AND PROJECT REPORT**

**Subject Code:MAOTS1-401**

**L T P C**  
**0 0 40 20**

**40 Hours**

**Course Objectives:** This subject will lead to practical understanding of the procedures. Project report making lead to a introduction on research investigations.

**INTERNSHIP/PROJECT REPORT**

Students have to carry out a research project (on any topic related to radiology) under the supervision of a faculty/hospital administration. The project report 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.