

**MRSPTU M.SC. (ANAESTHESIA & OPERATION THEATRE TECHNOLOGY)
SYLLABUS BATCH 2021 ONWARDS (2 YEARS COURSE)**

Total Credits = 24

SEMESTER 1st		Contact Hrs.			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MAOTS1-101	Principles of Anesthesia Technology	3	1	0	40	60	100	4
MAOTS1-102	Surgical Equipment And Technology	3	1	0	40	60	100	4
MAOTS1-103	Microbiology And Pathology	3	1	0	40	60	100	4
MAOTS1-104	Anatomy & Physiology - I	3	1	0	40	60	100	4
MAOTS1-105	General Principles of Hospital Practices	3	0	0	40	60	100	3
MAOTS1-106	Surgical Equipment And Technology Laboratory	0	0	4	60	40	100	2
MAOTS1-107	Anatomy & Physiology-I Laboratory	0	0	4	60	40	100	2
MAOTS1-108	Seminar/Presentation/Journal Club	0	0	2	60	40	100	1
	Total	-	-	-	380	420	800	24

Total Credits = 24

SEMESTER 2nd		Contact Hrs.			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MAOTS1-201	Principles of Anesthesia	3	1	0	40	60	100	4
MAOTS1-202	Surgical Tools And Techniques	3	1	0	40	60	100	4
MAOTS1-203	Anatomy & Physiology-II	3	1	0	40	60	100	4
MAOTS1-204	Principles Of Hospital Practices	3	0	0	40	60	100	3
MAOTS1-205	Immunology & Pathology	3	0	0	40	60	100	3
MAOTS1-206	Surgical Equipment & Anesthesia Technology Laboratory	0	0	4	60	40	100	2
MAOTS1-207	Anatomy & Physiology-II Laboratory	0	0	4	60	40	100	2
MAOTS1-208	Guest Lecture/Tutorial/Seminar/ Visit to Medical Research Institution/ Clinical Laboratory/ Hospital Postings	0	0	4	60	40	100	2
	Total	-	-	-	380	420	800	24

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Total Credits = 22

SEMESTER 3rd		Contact Hrs.			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MAOTS1-301	General Medicines Relevant To Anaesthesia	3	1	0	40	60	100	4
MAOTS1-302	Surgical Procedures With Anaesthesia	3	1	0	40	60	100	4
MAOTS1-303	Anaesthetic Equipment And Instruments	3	1	0	40	60	100	4
MAOTS1-304	Advanced Surgical Instruments	3	0	0	40	60	100	3
MAOTS1-305	Principles of Total Quality Management	1	0	0	20	30	50	1
MAOTS1-306	Advanced Surgical And Anaesthesia Laboratory	0	0	4	60	40	100	2
MAOTS1-307	Anaesthetic Equipment Laboratory	0	0	4	60	40	100	2
MAOTS1-308	Guest Lecture/Tutorial/Seminar/ Visit to Medical Research Institution/ Clinical Laboratory/ Hospital Postings	0	0	4	60	40	100	2
	Total	-	-	-	360	390	750	22

Total Credits = 20

SEMESTER 4th		Contact Hrs.			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MAOTS1-401	Internship and Dissertation	0	0	40	80	120	200	20
	Total	0	0	40	80	120	200	20

Overall Marks / Credits

Semester	Marks	Credits
1 st	800	24
2 nd	800	24
3 rd	750	22
4 th	200	20
Total	2550	90

MRSPTU

PRINCIPLES OF ANESTHESIA TECHNOLOGY

Subject Code:MAOTS1-101

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

15 Hours

Principle of anesthesia; Types of anesthesia; Parts of anesthesia machine; Pre-anesthetic check-up of patient; care and preparation of patient in pre-operative ward; preparation of patient in operation theatre; care and monitoring of patient in post-operative ward; management of O.T. before operation.

UNIT-II

15 Hours

Pre-operative preparation of patient; Intra-venous fluids; Monitoring of patient; Induction agents; Work Station, Induction, Endotracheal Tubes, Airways Maintenance of anesthesia, Positioning of the patient.

UNIT-III

10 Hours

Breaking systems; Classification of breaking system; Laryngoscopy; Medical gas supply; Compressed gas cylinders; Color coding of cylinders and inhalation agents; alarms and safety devices of anesthesia machine

UNIT-IV

5 Hours

Pipeline system of anesthetic gases; central pipeline system; compressed gases; indications and alarms; bulk gas cylinders.

UNIT-V

10 Hours

Anesthesia breathing system; Maplesons classification of non-breathing system; CO₂ absorption; Closed anesthetic breathing system; Face-masks; Endotracheal tubes; Artificial airways; Laryngoscopes; connectors and catheter mounts.

UNIT-VI

5 Hours

Monitors; Pulse Oximetry; Types of monitoring; Commonly used I.V. fluids; 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
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SURGICAL EQUIPMENT'S AND TECHNOLOGY

Subject Code:MAOTS1-102

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

Principle of Surgical equipments and their uses; Members of surgical team; Role of operation theatre technician; Various techniques of incisions; scrubbing technique; Preparation of O.T. room; cleaning and sterilization of operating room; Care and maintenance of surgical equipments.

UNIT- II

10 Hours

General surgical procedures and instruments, preparation of operation theatre; care of surgical patients; transportation of surgical patient, size of operating room and ventilation, Cleaning of O.T., preparation of surgical instruments trolley.

UNIT- III

10 Hours

Preparation of laparoscopic instruments; cleaning and care of laparoscopic instruments; Incision and its types, instruments used for general surgery, orthopedic surgical instruments, Gynecology procedure instruments major abdominal incision, minor surgical procedure instruments.

UNIT-IV

10 Hours

Operating tables; Suction machine; Diathermy machine; microscopes; Operating lights; Operating trolleys.

UNIT- V

10 Hours

Cleaning and care of wound; Dressing materials; different types of Dressings; different types of disinfectants, dressing procedure, Positioning and its Types , various types of Suture Materials, Different types of Drains, Catheters, Drip Sets, Bags.

UNIT- VI

10 Hours

Types of Operation table and positions, use of Diathermy machine, use of Suction machine , Types jars, Suction tubes, emergency lights, checking and arranging of instruments on the table, instrument trolleys.

Suggestive Readings

Text Books:

- Synopsis of medical instruments by Ajay Jadav and Arora, Jaypee publishers
- 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 publishers

MICROBIOLOGY AND PATHOLOGY

Subject Code:MAOTS1-103

L T P C
3 1 0 4

Duration: 60 Hours

Course Objectives: In this course to study about the microbiology and pathology of various diseases

Course Syllabus:

UNIT-I

10 Hours

Microbiology- Sterilization & decontamination- Dry Heat , Moist Heat; Sterilization - Chemical methods, Gaseous methods, Filtration; Wound Infection & Urinary Tract Infections; Blood stream Infections; Respiratory tract Infection; *Salmonella typhi*, Paratyphi 'A', *Salmonella typhimurium*, Catheter, IV associated Infections; Hospital acquired infections & prevention of hospital acquired infections; Hepatitis C

UNIT-II

10 Hours

Immunology: History and introduction to immunology; Immunity; Innate and acquired immunity including basic concepts about their mechanisms; Definition, types of antigens and Determinants of antigenicity; Definition, types, structure and properties of immunoglobulins; Antigen-Antibody reactions; Principle, procedure and applications of Complement fixation test, Immunofluorescence, ELISA, CCIEP, and RIA, SDS-PAGE and western blotting in Medical Microbiology

UNIT-III

10 Hours

Immunology: Principle, procedure and interpretation of various serological tests i.e. Widal, VDRL, ASO, CRP, Brucella tube agglutination and Rose-Waaler; Raising of high titer antisera in laboratory animals and its standardization; Complement system: Definition and Basic concepts about its components and complement activation pathways; Immune response: Introduction & Basic concepts of Humoral and Cellular immune responses; Hypersensitivity: Definition and Types of hypersensitivity reactions; Basic concepts of autoimmunity and brief knowledge about autoimmune diseases; Vaccines: Definition, Types.

UNIT-IV

10 Hours

Cell injury and adaptation: Causes of cell injury. Mechanism of cell injury, ischaemia & hypoxic injury, chemical injury, reversible injury, necrosis, cellular adaptation of growth & Differentiation atrophy, hypertrophy, metaplasia, hyperplasia, classification of tumors, premalignant lesion, diagnosis of cancer. Acute and chronic inflammation: Acute vascular changes; phagocytosis; Chemical mediators of inflammation: Definition and causes of chronic inflammation. Granulomatous inflammation, system manifestations of inflammation.

UNIT-V

10 Hours

Disorders of vascular flow and shock: Oedema, hyperemia or congestion, thrombosis, embolism. Infarction shock, Ischemia, Over-hydration, dehydration. The response to infection: Categories of infectious agents, host barriers to infection, how disease is caused, inflammatory response to infectious agents

UNIT-VI

10 Hours

The haematophotic and lymphoid system: Haemorrhage, various type of anaemia, leucopenia, leucocytosis, bleeding disorders coagulation mechanism, maintenance of blood volume. Abnormalities of pH of blood. Pathogenesis of the various diseases of the heart and lungs.

Recommended Books:

Text- Books

- Text book of Microbiology by Ananthanereyan and Panikergy, Universities Press
- Text book of Microbiology by Michael J. Pelczar, JR. E.C.S Chan & Noel R. Krieg logy, Tata McGraw Hill

Reference Books:

- Textbook of Pathology by Harsh Mohan, Universities Press
- Text book of Pathology by D.R Imtyaz want, Pee Vee (PV)

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ANATOMY AND PHYSIOLOGY- I

Subject Code:MAOTS1-104

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. Moreover know about correct uses of different types of surgical instrument in surgery.

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

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

GENERAL PRINCIPLES OF HOSPITAL PRACTICES

Subject Code: MAOTS1-105

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

5 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

10Hours

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

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, supports.

UNIT-V

10 Hours

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

SURGICAL EQUIPMENTS AND TECHNOLOGY LABORATORY

Subject Code:MAOTS1-106

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) Preparation and sterilization of OT for surgery.
- 2) Preparation of surgical patients.
- 3) Cleaning and dressing of wound.
- 4) Preparation of surgical instruments in the trolley.
- 5) Care and maintenance of operating patient in post- operative word.

Suggestive Readings:

Text- Books:

- ajayjadav and arora Synopsis of medical instruments jaypee
- Raymond Maurice Kirk Basic Surgical Techniques ELSEVIOR

Reference Books:

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

ANATOMY AND PHYSIOLOGY LABORATORY-I

Subject Code:MAOTS1-107

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 and models
5. To study the nervous system using specimen and models
6. To study the endocrine system using specimen and models
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