MALLAREDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED HEALTH CARE SCIENCES AND TECHNOLOGY

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Hyderabad-500055

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Program

MASTERS IN ANAESTHESIA AND OPERATION THEATRE TECHNOLOGY

2026

MALLA REDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED HEALTH CARE SCIENCES AND TECHNOLOGY

MASTERS IN ANAESTHESIA & OPERATION THEATRE TECHNOLOGY

Vision

To produce highly skilled anesthesia and operation theatre technologists who contribute to safe perioperative patient care through advanced clinical competence, critical thinking, research, and professional excellence in anesthesia and surgical technology.

Mission

Provide advanced theoretical knowledge, hands-on clinical training, research exposure, and ethical professional practices in anesthesia, operation theatre management, perioperative care, and critical care technology to support modern healthcare services and improve patient outcomes.

Program Educational Objectives (PEOs)

Graduates will:

- Apply advanced anesthesia and operation theatre technology knowledge in clinical practice
- Assist anesthesiologists and surgeons in perioperative and surgical procedures effectively
- Ensure patient safety, infection control, and quality assurance in operation theatres
- Handle and maintain anesthesia machines, monitoring devices, and OT equipment efficiently
- Participate in research, evidence-based practice, and healthcare quality improvement
- Demonstrate leadership, communication, teamwork, and ethical professional behavior in multidisciplinary healthcare settings

Program Outcomes (POs)

Students will:

- Understand advanced anatomy, physiology, pharmacology, and pathology related to anesthesia and surgery
- Apply principles of anesthesia technology in general, regional, and local anesthesia procedures
- Assist in preoperative, intraoperative, and postoperative patient care
- Operate anesthesia workstations, ventilators, monitors, and surgical equipment safely
- Apply infection prevention, sterilization, and biomedical waste management protocols
- Monitor patients and respond effectively to anesthesia and surgical emergencies
- Maintain anesthesia records, OT documentation, and patient data management systems

- Communicate effectively with patients, surgeons, anesthesiologists, nurses, and healthcare teams
- Follow ethical principles, legal responsibilities, and professional standards in healthcare practice
- Utilize modern technologies and advancements in anesthesia and operation theatre practice

Program Specific Outcomes (PSOs)

Students can:

- Assist independently under supervision in anesthesia administration and surgical procedures
- Handle anesthesia machines, airway devices, ventilators, monitors, and OT instruments effectively
- Perform operation theatre preparation, patient positioning, and perioperative support procedures
- Apply advanced airway management and resuscitation techniques during emergencies
- Support critical care, trauma, laparoscopic, cardiac, neuro, and specialty surgical procedures
- Maintain sterilization, disinfection, and infection control standards in OT complexes
- Apply quality assurance, patient safety, and risk management protocols in perioperative care
- Participate in hospital administration, clinical audits, research activities, and healthcare documentation

Course Outcomes (COs)

Students will:

- Understand principles and advanced applications of anesthesia and operation theatre technology
- Identify indications, contraindications, complications, and management of anesthesia procedures
- Prepare patients for surgical and anesthesia procedures safely and effectively
- Assist in general anesthesia, regional anesthesia, monitored anesthesia care, and emergency procedures
- Operate, troubleshoot, and maintain anesthesia and OT equipment and accessories
- Apply sterilization, disinfection, aseptic techniques, and infection control practices
- Monitor patient vital signs and assist in perioperative emergency and critical care management
- Maintain anesthesia records, OT registers, and clinical documentation accurately

COURSE STRUCTURE

I YEAR/I SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
		L/T	P/D	CLP	CR	Theory			Practical			Total
						IA	SEE	Total	IA	SEE	Total	
MAOT1.1	Review of Applied sciences	3	--	--	3	20	80	100	---	--	--	100
MAOT1.2	Anaesthetic equipment and procedures	3	1	2	6	20	80	100	20	80	100	200
MAOT1.3	Anaesthetics and emergency drugs	3	1	2	6	20	80	100	20	80	100	200
MAOT1.4	Applied surgical technology	3	--	2	5	20	80	100	--	--	--	100
	GRAND TOTAL	**12**	**2**	**6**	**20**	**-**	-	-	-	-	-	**600**

I YEAR/II SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
		L/T	P/D	CLP	CR	Theory			Practical			Total
						IA	SEE	Total	IA	SEE	Total	
MAOT2.1	Advanced anaesthesia techniques	3	1	2	6	20	80	100	20	80	100	200
MAOT2.2	Speciality Anaesthesia-I	3	1	1	5	20	80	100	20	80	100	200
MAOT2.3	Clinical surgery-I	3	1	2	6	20	80	100	20	80	100	200
MAOT2.4	Research methodology & biostatistics (should include one unit related to teaching methodology)	4	--	--	4	20	80	100	---	---	--	100
	GRAND TOTAL	**13**	**3**	**5**	**21**	**-**	-	-	-	-		**700**

II YEAR/III SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
		L/T	P/D	CLP	CR	Theory			Practical			Total
						IA	SEE	Total	IA	SEE	Total	
MAOT3.1	Speciality Anaesthesia-II	3	1	4	8	20	80	100	20	80	100	**200**
MAOT3.2	Clinical surgery-II	3	1	3	7	20	80	100	20	80	100	**200**
MAOT3.3	Health care management (includes principles of management)	3	--	--	3	20	80	100	---	---	--	**100**
	GRAND TOTAL	**9**	**2**	**7**	**18**	**-**	-	-	-	-	--	**500**

II YEAR/IV SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						Total
		L/T	P/D	CLP	CR	Theory			Practical			
						IA	SEE	Total	IA	SEE	Total	
MAOT 4.1	Clinical Medicine & critical care management	5	1	1	7	20	80	100	20	80	100	200
MAOT 4.2	Dissertation evaluation	--	--	8	8	--	---	--	-	100	100	100
	GRAND TOTAL	**5**	**1**	**9**	**15**	**--**	--	--	-	-	-	**300**

L - Lectures, T - Theory, P/D –Practicals/Demonstration, CLP – Clinical Posting, CR - Credits.

IA - Internal Assessment, SEE – Semester End Examination

1.1 Post Graduate Programme

Sl. No.	Course	Duration	Eligibility for admission
1	M.Sc. Anaesthesia and operation Theatre technology	2 years	He/she has passed the BSc in Anaesthesia & operation Theatre Technology or equivalent examination of a recognized Indian University or a duly constituted Board with pass marks (50%).

1.2. Medium of Instruction:

English shall be the medium of instruction for all subjects of study and for examinations.

1.3. Duration of the Course

Duration details are mentioned under clause no. 1.1 of this booklet.

1.4 Examination Regulations

1.4.1 Attendance: 75% of attendance (physical presence) is mandatory.

Medical leave or other types of sanctioned leaves will not be counted as physical presence. Attendance will be counted from the date of commencement of the session to the last day of the closing of attendance before the final examination.

1.4.2 Internal Assessments:

a) Regular periodic assessment shall be conducted throughout the course. In each semester there will be **two one-hour internal assessments (15 marks each)** and a continuous assessment (10 marks). Thus, a total of 40 marks for the internal exam. (i.e. weightage for internal assessment shall be 40% of the total marks in each subject).

b) **Exam pattern for internal assessment** in each semester will be

(a) Short questions 3 nos. each carrying 5 marks (i.e. 3 x 5=15 marks). Two such internal examinations will be conducted.

(b) Continuous assessment of the student will be done. Students' overall attendance, performance in class, behaviour of the student, presentations, extra-curricular activities etc will be assessed. Continuous assessment carries 10 marks.

(d) Thus, a total of 40 marks for the internal examination. (15+15+10=40 marks). A candidate should secure a minimum of 40% marks in the internal assessment in each subject to be eligible to appear for the University examination

(e) For value added courses, only internal examination will be conducted. The assessment comprised of five assignments/presentations/case presentations each carrying 10 (i.e. 5 x 10 = 50 marks). Final examination will be for 50 marks with 5 questions each carrying 10 marks (5 x 10 = 50 marks). The minimum pass is 40% marks.

1.4.3 University Examinations (External):

a) University Examination shall be conducted at the end of every semester.

b) A candidate who satisfies the requirement of attendance and internal assessment marks, as stipulated by the University shall be eligible to appear for the University Examination.

c) Examination will be of 3 hours duration (for theory). The question pattern for those subjects without practical examination (60 marks) will be (a) Three essay questions out of which the student should answer 2 questions each carrying 10 marks (i.e. 2 x 10 = 20 marks) (b) Eight short note questions out of which the student should attempt six questions, each carrying 5 marks (6 x 5 = 30 marks). (c) Ten very short questions each carrying 1 mark (i.e. 10 x 1 = 10 marks). Thus, a total of 60 marks.

d) The question pattern for practical examination (a) Spotters/major practical/minor practical/case presenting/Viva/practical/log record.

The minimum pass for internal assessment is 40% and for the University Examination is 50%. i.e. a student should score a total of 50% (adding the internal and external examination) to pass in each subject.

I YEAR/ I SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
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						IA	SEE	Total	IA	SEE	Total	
MAOT1.1	Review of Applied sciences	3	--	--	3	20	80	100	---	--	--	100
MAOT1.2	Anaesthetic equipment and procedures	3	1	2	6	20	80	100	20	80	100	200
MAOT1.3	Anaesthetics and emergency drugs	3	1	2	6	20	80	100	20	80	100	200
MAOT1.4	Applied surgical technology	3	--	2	5	20	80	100	--	--	--	100
	GRAND TOTAL	**12**	**2**	**6**	**20**							**600**

MAOT1.1 – REVIEW OF APPLIED SCIENCES

L/T	P/D	CLP	C
3	0	0	3

Learning Objectives

At the end of this course, students will be able to:

1. Understand the anatomy and physiology related to anesthesia and perioperative care.
2. Explain respiratory, cardiovascular, hepatobiliary, and nervous system functions.
3. Describe lung function tests, coagulation mechanisms, and acid-base balance.
4. Understand the pharmacology of autonomic drugs, emergency drugs, and related medications.
5. Identify principles of immunology, hypersensitivity, antibiotic resistance, and nosocomial infections.

Course Outcomes (COs)

- CO1: Discuss the anatomy of brain, spinal cord, respiratory, and cardiovascular systems.
- CO2: Explain respiratory physiology, circulation, and lung function tests.
- CO3: Describe coagulation mechanisms, acid-base balance, and hepatobiliary physiology.

- CO4: Explain the pharmacology of adrenergic, cholinergic, antihypertensive, and emergency drugs.
- CO5: Identify adverse drug reactions, drug interactions, and drugs used in coagulation disorders.
- CO6: Understand immunology, hypersensitivity reactions, antibiotic resistance, and nosocomial infections.

UNIT I:

Applied Anatomy – Nervous System **9 HOURS**

- Parts of brain
- Coverings of spinal cord
- Tracts of spinal cord
- Cerebrospinal fluid (CSF)

UNIT II:

Applied Anatomy

–Respiratory, Cardiovascular & Other Systems **12 HOURS**

- Bronchopulmonary segments and alveoli
- Systemic and pulmonary circulation
- Coronary circulation
- Hepatobiliary system – Liver, biliary apparatus
- Urinary system

UNIT III:

Applied Physiology **13 HOURS**

- Respiratory physiology
- Spirometry
- Lung function tests
- Oxygen transport and carbon dioxide transport
- Conducting system of heart
- Neuromuscular junction
- Coagulation and its disorders
- Acid-base physiology
- Hepatobiliary physiology

UNIT IV:

Applied Pharmacology **10 HOURS**

- Adverse drug reactions and drug interactions
- Drugs acting on autonomic nervous system ;Adrenergic drugs and blockers ,Cholinergic drugs and blockers
- Diuretics
- Antiarrhythmics
- Antihypertensive drugs
- Corticosteroids

- Drugs used in coagulation disorders
- Other drugs - Insulin ,Oxytocin ,Methylergometrine

UNIT V:

Microbiology & Immunology **4 HOURS**

- Immunity
- Antigen
- Antibody
- Hypersensitivity
- Antibiotic resistance
- Nosocomial infections : Meningitis ,Hepatitis HIV infection & AIDS ,Urinary tract infection (UTI) ,Pneumonia ,MRSA infection
- Prophylactic immunization and management

REFERENCE BOOKS:

1. Essentials of medical pharmacology (Latest edition) – KD Tripathi
2. Textbook of Pharmacology for Dental and Allied Health Sciences (Latest edition)- Padmaja Udaykumar
3. Text book of Medical Physiology – Indu Khurana 4
4. Manipal manual of Anatomy for Allied Health Sciences Courses- Sampath Madhyastha
5. BD Chaurasia‟s Human Anatomy – volume1

MAOT1.2 – ANAESTHETIC EQUIPMENT AND PROCEDURES

L/T	P/D	CLP	C
3	1	2	6

COURSE LEARNING OBJECTIVES

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

- Understand medical gas systems and safe handling
- Perform safety checks of anaesthesia workstation and equipment
- Operate and interpret basic anaesthesia monitoring systems
- Handle airway devices and difficult airway equipment
- Apply knowledge of hemodynamic monitoring and simulation training
- Identify and troubleshoot anaesthesia equipment faults

COURSE OUTCOMES (COs)

CO1: Demonstrate anaesthesia workstation components and safety checks
CO2: Operate and troubleshoot gas supply and scavenging systems
CO3: Use and interpret monitoring devices in anaesthesia
CO4: Manage airway equipment including difficult airway cart
CO5: Perform hemodynamic monitoring and understand defibrillation
CO6: Apply updates in anaesthesia technology and simulation training

UNIT 1:

Medical Gas System & Anaesthesia Workstation **9 Hours**

- Medical gas supply, storage and safety
- Pipeline gas distribution system
- Anaesthesia machine components
- Fail-safe systems
- Anaesthesia workstation checks
- Scavenging system basics

UNIT 2

Monitoring Equipment in Anaesthesia **10 HOURS**

- Respiratory gas monitoring and MAC
- Depth of anaesthesia (BIS, entropy)
- Neuromuscular monitoring
- Cardiac output monitoring
- Regional and neuraxial monitoring equipment
- MRI-compatible anaesthesia equipment
- Remote location anaesthesia monitoring

UNIT 3

Airway Management Devices **9 HOURS**

- Surgical airway equipment
- Percutaneous airway devices
- Optical laryngoscopes
- Fiberoptic bronchoscopes
- Airway introducers
- Difficult airway gadgets and cart preparation
- Alternative intubation techniques

UNIT 4:

Hemodynamic Monitoring & Emergency Devices **9 HOURS**

- Invasive BP monitoring
- Non-invasive BP monitoring (oscillometer)
- Pressure transducers, damping, resonance
- Defibrillator principles and use
- Hemodynamic monitoring concepts

UNIT 5:

Advanced Anaesthesia Technology & Simulation **8 HOURS**

- Smart pumps and infusion systems
- Advanced supraglottic airway devices
- Optical stylets and Ventrain device
- Anaesthesia in MRI and remote areas
- Simulation in anaesthesia (mask ventilation, intubation, crisis training)

PRACTICAL / DEMONSTRATION 30 HOURS

- Routine and periodic checks of anaesthesia workstation, gas supply and scavenging systems
- Troubleshooting of anaesthesia workstation and monitoring systems
- Assembly of gadgets for difficult airway management
- Preparation of invasive blood pressure monitoring systems
- Arrangement of trolley for surgical airway procedures
- Simulation in anaesthesia including mask ventilation, laryngoscopy and endotracheal intubation
- Training in use of anaesthesia equipment in MRI field
- Pre-use check of anaesthesia equipment
- Sterilization and maintenance of anaesthesia equipment
- Anaesthesia in remote locations including emergency department, endoscopy room, IVF center and labour theatre

REFERENCE BOOKS:

1. A practical approach to anaesthesia equipment- Jerry A Dorsch & Susan E Dorsch
2. Anaesthesia equipment simplified- Gregory Rose & J Thomas Mclarney
3. Understanding anaesthetic equipments and procedures A practical approach- Dwarakadas K Baheti & Vandana V Laheri

MAOT1.3 – ANAESTHETICS AND EMERGENCY DRUGS

L/T	P/D	CLP	C
3	1	2	6

Learning Objectives

1. Understand commonly used anesthetic and emergency drugs.
2. Learn preparation, dosage, and dilution techniques.
3. Identify side effects and emergency management.
4. Understand fluid therapy and blood transfusion.
5. Demonstrate drug administration safely.

Course Outcomes (COs)

CO1: Describe pharmacology of emergency drugs.
CO2: Demonstrate preparation of emergency drugs.
CO3: Discuss antiemetic drugs.
CO4: Demonstrate electrolyte dilution techniques.
CO5: Explain fluid infusion and blood transfusion.
CO6: Discuss transfusion hazards.

UNIT I:

Core Anaesthetic Drugs **11 Hours**

- IV induction agents
- Opioids
- Volatile anesthetics
- Sedatives
- Local anesthetics
- Muscle relaxants
- NSAIDs

UNIT II:

Emergency Drugs **12 Hours**

- Oxygen
- Inotropes
- Vasodilators
- Anticholinergics
- Bronchodilators
- Sympathomimetics

UNIT III:

Other Important Drugs **10 Hours**

- Antiemetics
- Antimicrobials
- Antihistamines
- Electrolytes
- Sodium bicarbonate
- Potassium chloride

UNIT IV:

Fluid Therapy & Transfusion **12 Hours**

- Body fluid distribution
- Crystalloids and colloids
- Blood components
- Blood transfusion

- Transfusion hazards

PRACTICAL / DEMONSTRATION 30 HOURS

- Drug preparation and dilution
- IV fluid infusion
- Blood transfusion demonstration
- Identification of side effects
- Emergency drug administration

Reference books:

1. Comparative Pharmacology for Anaesthetist: Armeen Ahmed, Vipin Dhama, Nitin Garg
2. A Primer of Anesthesia- Rajeshwari Subramaniam
3. Drugs in anaesthesia & intensive care- Edward Scarth & Susan Smith.

MAOT1.4 – APPLIED SURGICAL TECHNOLOGY

L/T	P/D	CLP	C
3	0	2	5

Learning Objectives

1. Understand basic surgical procedures and diagnosis.
2. Apply aseptic and infection control techniques.
3. Learn wound management and suturing techniques.
4. Identify surgical instruments and devices.
5. Ensure patient safety during surgery.

Course Outcomes (COs)

CO1: Understand surgical diagnosis.
CO2: Demonstrate aseptic techniques.
CO3: Explain suturing techniques.
CO4: Classify surgical instruments.
CO5: Maintain surgical devices safely.

UNIT I:

Surgical diagnosis **8 Hours**

- History taking
- Physical examination
- Radiographic findings
- Laboratory investigations
- Differential diagnosis

UNIT II:

Surgical Asepsis & Infection Prevention **12 Hours**

- Medical asepsis
- Surgical asepsis
- Surgical infections
- Antibiotic prophylaxis
- Surgical incisions

UNIT III:

Wound Management **11 Hours**

- Debridement
- Edema control
- Suturing techniques
- Anastomosis
- Abdominal drainage

UNIT IV:

Surgical Instrumentation **14 Hours**

- Patient transfer and positioning
- Electrocautery
- Lasers
- Surgical microscopes
- Endoscopes

UNIT V:

OT Safety & Surgical Devices

- Maintenance of surgical devices
- Risks and precautions
- Patient safety protocols

PRACTICALS

CLINICAL POSTINGS **90 HOURS**

REFERENCE BOOKS:

1. Basic surgical skills and techniques- Sudhir Kumar Jain, David L Stoker & Raman Tanwar
2. Berry & Kohn‟s Operating Room Technique (Latest edition)
3. Pocket guide to the Operating Room- Jaypee Latest edition

I YEAR/ II SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
		L/T	P/D	CLP	CR	Theory			Practical			Total
						IA	SEE	Total	IA	SEE	Total	
MAOT2.1	Advanced anaesthesia techniques	3	1	2	6	20	80	100	20	80	100	200
MAOT2.2	Speciality Anaesthesia-I	3	1	1	5	20	80	100	20	80	100	200
MAOT2.3	Clinical surgery-I	3	1	2	6	20	80	100	20	80	100	200
MAOT2.4	Research methodology & biostatistics (should include one unit related to teaching methodology)	4	--	--	4	20	80	100	---	---	--	100
	GRAND TOTAL	**13**	**3**	**5**	**21**							**700**

MAOT2.1 – ADVANCED ANAESTHESIA TECHNIQUES

L/T 3 P/D 1 CLP 2 C 6

Learning Objectives

- Understand vascular access techniques and regional anaesthesia procedures
- Develop knowledge of ultrasound applications in ICU and anaesthesia
- Understand general anaesthesia techniques and complications
- Identify and manage anaesthetic emergencies
- Gain exposure to modern anaesthesia technology and simulation

Course Outcomes (COs)

CO1: Perform peripheral venous cannulation and vascular access techniques
CO2: Demonstrate central neuraxial and peripheral nerve block procedures
CO3: Apply ultrasound techniques in ICU and anaesthesia practice
CO4: Explain modern anaesthesia technologies and monitoring systems
CO5: Identify and manage anaesthetic emergencies effectively

UNIT 1

Vascular & Regional Anaesthesia + ICU Ultrasound **11 HOURS**

- Vascular cannulation
- Central neuraxial blockade
- Peripheral nerve blocks
- Post anaesthesia care
- Ultrasound in ICU (FAST, volume, thoracic ultrasound)

UNIT 2

Modern Anaesthesia Technology **11 HOURS**

- Ultrasound, fiberoptic, X-ray in anaesthesia
- Smart pumps and infusion systems
- Anaesthesia information management systems
- Clinical & decision support systems

UNIT 3

General Anaesthesia **10 HOURS**

- Types and techniques
- Awareness under anaesthesia
- Complications
- Paediatric anaesthesia
- Management of GA

UNIT 4

Anaesthetic Emergencies **13 HOURS**

- Emergency guidelines
- Airway emergencies
- Anaphylaxis
- Local anaesthetic toxicity
- Malignant hyperthermia
- Emergency surgery anaesthesia principles (RSI, ventilation, airway protection)

PRACTICAL: 30 HOURS

- Assembly of anaesthesia cart – vascular cannulation techniques (02 Hours)
- Central neuraxial blockade cart preparation and setup (04 Hours)
- General anaesthesia workstation assembly and preparation (04 Hours)
- Peripheral nerve block cart assembly and preparation (02 Hours)
- Use and troubleshooting of ultrasound in anaesthesia (03 Hours)
- Fiberoptic equipment handling and troubleshooting (03 Hours)
- Smart pumps and computer-controlled infusion systems (03 Hours)
- Identification and management of airway emergencies (03 Hours)

- Preparation of emergency anaesthesia cart for surgeries (03 Hours)
- Intraoperative monitoring and ventilation management (03 Hours)

Reference books:

1. Step by step practical aspects of emergency anesthesia- Arun Kumar Paul
2. Anesthesiology updates for postgraduates- Sampa Dutta Gupta
3. Morgan and Mikhail's Clinical Anesthesiology

MAOT2.2 – SPECIALITY ANAESTHESIA-I

L/T	P/D	CLP	C
3	1	1	5

Learning Objectives

- Understand anaesthetic management in specialty surgeries
- Develop skills in patient preparation and perioperative care
- Understand positioning and monitoring in different surgeries
- Gain knowledge of obstetric, orthopaedic, ENT, and oncology anaesthesia

Course Outcomes (COs)

CO1: Prepare and manage anaesthesia for laparoscopic and robotic surgeries
CO2: Demonstrate anaesthesia techniques in obstetric and gynaecological procedures
CO3: Apply anaesthesia knowledge in orthopaedic and ophthalmic surgeries
CO4: Manage anaesthesia for ENT and oncological surgeries
CO5: Ensure safe perioperative and post-operative care

UNIT 1

Laparoscopic, Robotic & Obstetric Anaesthesia **15 HOURS**

- Laparoscopic & robotic surgeries
- Obstetric & gynecological procedures
- Patient preparation
- Anaesthetic management
- Post-operative care

UNIT 2

Orthopaedic & Ophthalmic Anaesthesia **15 HOURS**

- Orthopaedic surgeries (upper limb, hip, knee, trauma)
- Paediatric orthopaedics
- Ophthalmic surgeries
- Positioning & perioperative care

UNIT 3

ENT & Onco Anaesthesia **15 HOURS**

- ENT surgeries (Tympanoplasty, FESS, tracheostomy, etc.)
- Onco surgeries
- Airway considerations
- Post-operative care

PRACTICAL: **30 HOURS**

- Anaesthesia for Laparoscopic Surgery
- Anaesthesia for Robotic Surgery
- Anaesthesia for obstetrics and gynaecological procedures
- Anaesthesia for ophthalmic procedures
- Anaesthesia for orthopaedic surgeries
- Anesthesia for Otorhinolaryngologic Surgeries
- Anesthesia for Onco surgeries

Reference books:

1. Anaesthesiology updates for postgraduates- Sampa Dutta Gupta
2. Textbook of Anaesthesia- Alan R Aitkenhead, David J Rowbotham, Graham Smith
3. A basic textbook is essential - Fundamentals of Anaesthesia- Tim Smith, Colin Pinnock, Ted Lin, and Robert Jones
4. Morgan and Mikhail's Clinical Anesthesiology

MAOT2.3 – CLINICAL SURGERY-I

L/T	P/D	CLP	C
3	1	2	6

Learning Objectives

- Understand principles of surgical diagnosis and management
- Gain knowledge of aseptic techniques and infection control
- Understand wound healing and surgical procedures
- Identify surgical instruments and their applications
- Learn patient safety and operative care

Course Outcomes (COs)

CO1: Develop and interpret surgical diagnosis
CO2: Apply aseptic techniques and infection prevention measures
CO3: Demonstrate wound care and suturing techniques
CO4: Identify and classify surgical instruments
CO5: Assist in patient positioning and safe surgical procedures

UNIT 1

Laparoscopic & Robotic Surgery **11 HOURS**

- Principles
- Types of laparoscopic surgery
- Advantages & disadvantages
- Safety issues
- Post-operative care

UNIT 2

Trauma, Spine & Orthopaedics **17 HOURS**

- Spinal cord injury management
- Facial trauma
- Fracture management
- Elective orthopaedics (upper limb, hip, knee, paediatrics)

UNIT 3

Ophthalmic & ENT Surgery **17 HOURS**

- Cataract, corneal transplant
- ENT surgeries (tonsillectomy, FESS, tracheostomy, etc.)

PRACTICAL: 30 HOURS

- Laparoscopic surgery
- Robotic surgery
- Neck and spine surgery
- Trauma to the face and mouth
- Elective orthopedic surgery
- Ophthalmic surgery
- ENT surgeries
- Obstetrics and gynaecological procedures

REFERENCE BOOKS:

1. Bailey & Loves Short Textbook of Surgery
2. Text book of surgery – S. Das
3. Manipal manual of surgery-K. Rajgopal Shenoy & Anitha Shenoy

MAOT2.4 – RESEARCH METHODOLOGY & BIOSTATISTICS	L/T	P/D	CLP	C
	4	0	0	4

Learning Objectives

- Understand basic biostatistics and research concepts
- Apply sampling methods and study designs
- Perform statistical tests and data interpretation
- Develop research proposals and scientific writing skills
- Understand ethics in research and publication

Course Outcomes (COs)

CO1: Apply statistical concepts in biomedical research
CO2: Use sampling techniques in research studies
CO3: Perform and interpret statistical tests
CO4: Design research studies and sample size calculation
CO5: Develop scientific writing and research documentation skills

CONTENT

UNIT 1

Introduction to Biostatistics **8 HOURS**

- Types of variables
- Central tendency
- Incidence & prevalence

UNIT 2

Sampling Methods **6 HOURS**

- Random & non-random sampling
- Sampling errors

UNIT 3

Probability & Distributions **8 HOURS**

- Normal, Poisson, Binomial distribution
- Skewness & kurtosis

UNIT 4

Tests of Significance **10 HOURS**

- Hypothesis testing

- T-test, ANOVA
- Chi-square, non-parametric tests

UNIT 5

Correlation & Regression **8 HOURS**

- Pearson & Spearman correlation
- Linear & multiple regression

UNIT 6

Sample Size Determination **2 HOURS**

- Mean & proportion estimation
- Comparison studies

UNIT 7

Study Designs **6 HOURS**

- Case-control
- Cohort
- Clinical trials
- Odds ratio & relative risk

UNIT 8

Multivariate Analysis **4 HOURS**

- Logistic regression
- Survival analysis

UNIT 9

Diagnostic Tests **2 HOURS**

- Reliability & validity

UNIT 10

Scientific Documentation **6 HOURS**

- Research protocol
- Thesis writing
- Journals
- Systematic review & meta-analysis

REFERENCE BOOKS:

1. ABC of research methodology and applied biostatistics by MN Parick & Nithya Gogtay.
2. Introduction to biostatistics and research methods by P.S.S. Sundar Rao & J. Richard
3. Research methodology & Biostatistics- A comprehensive guide for health care professionals-Suresh K. Sharma

II YEAR/III SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						
		L/T	P/D	CLP	CR	Theory			Practical			Total
						IA	SEE	Total	IA	SEE	Total	
MAOT3.1	Speciality Anaesthesia-II	3	1	4	8	20	80	100	20	80	100	**200**
MAOT3.2	Clinical surgery-II	3	1	3	7	20	80	100	20	80	100	**200**
MAOT3.3	Health care management (includes principles of management)	3	--	--	3	20	80	100	---	---	--	**100**
	GRAND TOTAL	**9**	**2**	**7**	**18**							**500**

MAOT3.1 – SPECIALITY ANAESTHESIA–II

L/T	P/D	CLP	C
3	1	4	8

LEARNING OBJECTIVES

- Understand anaesthesia requirements for neurosurgery, paediatric, cardiac, GU, plastic and transplant surgeries
- Develop skills in perioperative anaesthetic planning for high-risk surgeries
- Learn monitoring and equipment usage in complex surgeries
- Understand pain clinic functioning and management
- Gain knowledge of ethical and legal issues in organ transplantation
- Apply safe anaesthetic techniques in speciality surgeries

COURSE OUTCOMES (CO)

CO1: Understand and manage anaesthesia for neurosurgeries
CO2: Understand and manage anaesthesia for paediatric surgeries
CO3: Understand and manage anaesthesia for cardiovascular surgeries
CO4: Understand and manage anaesthesia for genitourinary surgeries
CO5: Understand and manage anaesthesia for plastic and reconstructive surgeries
CO6: Understand and manage anaesthesia for organ transplantation

CONTENT

UNIT I –

NEUROSURGERY & PAEDIATRIC ANAESTHESIA (15 HOURS)

- ICP and intracranial tension concepts
- Patient preparation for neurosurgery
- Anaesthetic management in neurosurgery

- Special considerations in brain surgery
- Post-operative care in neurosurgical patients
- Paediatric anaesthesia principles
- Drug dosage and physiological differences in children
- Paediatric airway management
- Post-operative paediatric care

UNIT II

CARDIOVASCULAR & GENITOURINARY ANAESTHESIA (15 HOURS)

- Preoperative assessment in cardiac patients
- Anaesthetic management in cardiac surgery
- Positioning in cardiac surgery
- Cardiopulmonary bypass basics
- Post-operative cardiac care
- Anaesthesia for GU surgeries
- Renal function assessment
- Fluid and electrolyte management
- Post-operative care in GU surgery

UNIT III

PLASTIC SURGERY & ORGAN TRANSPLANT ANAESTHESIA (15 HOURS)

- Preoperative assessment in plastic surgery
- Anaesthetic techniques in reconstructive surgery
- Tissue graft and flap surgery considerations
- Pain management in plastic surgery
- Organ transplantation basics
- Cadaveric organ donation process
- Living donor transplantation
- Ethical and legal issues in transplantation
- Anaesthetic management in transplant surgery

PRACTICAL / DEMONSTRATION (30 HOURS)

- Setup of monitoring systems for neurosurgery
- Anaesthesia preparation for paediatric surgery
- Cardiovascular surgery OT setup
- Genitourinary surgery preparation
- Plastic & reconstructive surgery setup
- Organ transplant anaesthesia preparation
- Simulation of anaesthetic emergencies
- Monitoring and equipment troubleshooting practice
- Patient positioning and safety drills
- Post-operative care simulation

REFERENCE BOOKS:

1. Anaesthesiology updates for postgraduates- Sampa Dutta Gupta
2. Textbook of Anaesthesia- Alan R Aitkenhead, David J Rowbotham, Graham Smith
3. A basic textbook is essential - Fundamentals of Anaesthesia- Tim Smith, Colin Pinnock, Ted Lin, and Robert Jones
4. Morgan and Mikhail's Clinical Anesthesiology

MAOT3.2 – CLINICAL SURGERY–II

L/T	P/D	CLP	C
3	1	3	7

LEARNING OBJECTIVES

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

1. Understand various super-speciality surgical procedures
2. Identify requirements for equipment, OT setup, and patient preparation
3. Apply knowledge of perioperative management in complex surgeries
4. Assist in surgical procedures with proper aseptic and safety protocols
5. Develop understanding of organ transplantation basics
6. Integrate knowledge of multidisciplinary surgical care

COURSE OUTCOMES (COs)

CO1: Understand and prepare for cardiac, thoracic and vascular surgeries
CO2: Understand organ transplantation procedures
CO3: Describe and prepare for elective neurosurgical procedures
CO4: Understand and prepare for plastic and reconstructive surgeries

CONTENT

UNIT I

ELECTIVE NEUROSURGERY & PLASTIC SURGERY — 15 HOURS

- Elective neurosurgery
  - Head injury management
  - Intracranial infection: investigation and treatment
  - Hydrocephalus management
  - Intracranial hemorrhage management
  - Epilepsy management
  - Brain death principles
- Plastic and reconstructive surgery
  - Spectrum of plastic surgery techniques
  - Skin grafts types
  - Principles and use of flaps
  - Management of complex tissue loss

UNIT II

THORAX, VASCULAR & CARDIAC SURGERY **20 HOURS**

- Thoracic surgery
  - Chest pathology investigation
  - Surgical oncology in thoracic procedures
- Vascular surgery
  - Vascular investigation methods
  - Direct repair techniques
  - Stenting, endarterectomy, bypass procedures
- Cardiac surgery
  - Preoperative investigation planning
  - Coronary artery disease management
  - Valvular heart disease surgery
  - Congenital heart disease surgery
  - Aortic and pericardial disease management

UNIT III

ORGAN TRANSPLANTATION **10 HOURS**

- Definition and concept of organ transplantation
- Transplant process workflow
- History and legal advances in transplantation
- Cadaveric organ donation
- Living donor transplantation
- Alternative organs
- Impact of transplantation on healthcare

PRACTICAL / DEMONSTRATION (30 HOURS)

- Setup and preparation for neurosurgery
- Setup and preparation for plastic and reconstructive surgery
- Setup for thoracic surgery
- Setup for vascular surgery
- Setup for cardiac surgery
- Setup for organ transplantation procedures
- Patient preparation and OT arrangement
- Sterility maintenance and instrument handling
- Team coordination in super-speciality surgeries

REFERENCE BOOKS:

1. Bailey & Loves Short Textbook of Surgery
2. Text book of surgery – S. Das
3. Manipal manual of surgery-K. Rajgopal Shenoy & Anitha Shenoy

MAOT3.3 – HEALTH CARE MANAGEMENT

L/T	P/D	CLP	C
3	0	0	3

LEARNING OBJECTIVES

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

1. Understand the role of healthcare manager in hospital and clinical settings
2. Apply management principles in healthcare organizations
3. Manage human resources, finances, and hospital resources effectively
4. Understand recruitment, training, and staff development systems
5. Apply inventory control and materials management in hospitals
6. Understand biomedical waste management and hospital safety systems

COURSE OUTCOMES (COs)

CO1: Understand and apply management concepts and theories
CO2: Describe management functions and administrative processes
CO3: Understand HRM principles and staffing procedures
CO4: Apply knowledge of training and staff development
CO5: Understand materials and equipment management systems
CO6: Apply inventory control, value analysis and biomedical waste management practices

CONTENT

UNIT I

MANAGEMENT CONCEPTS AND FUNCTIONS **13 HOURS**

- Management and organizations
- Role of management in healthcare
- Levels of managers and managerial skills
- Classical school of management
- Behavioural school of management
- Management science approach
- Planning
- Organizing
- Staffing
- Directing
- Controlling

UNIT II

HRM AND TRAINING DEVELOPMENT **10 HOURS**

Basics of HRM and HRD relationship

- Objectives of HRM
- HR planning (short-term and long-term)
- Productivity analysis in healthcare

- HR policies and procedures
- Recruitment, selection and placement
- Induction and orientation
- Staff training methods
- Career development
- Management development programs

UNIT III

MATERIALS MANAGEMENT & EQUIPMENT MANAGEMENT 12 HOURS

Introduction to materials management

- Equipment management:
- Planning and selection of equipment
- Equipment procurement and import
- Equipment utilization
- Maintenance and repair systems
- Equipment audit and evaluation

UNIT IV

INVENTORY CONTROL & BIOMEDICAL WASTE MANAGEMENT 10 HOURS

Codification and standardization

- Value analysis in healthcare
- Inventory control systems
- Lead time, safety stock, reorder level
- Economic Order Quantity (EOQ)
- Selective inventory control methods
- Case studies in inventory management
- Biomedical Waste Management Rules

REFERENCE BOOKS:

1. Introduction to health care management by Sharoon B & Nancy H
2. Foundations of health care management – Bernard J Healy & Marc C Marchese

II YEAR/ IV SEMESTER

Course Code	Course Title	Credit(s) distribution				Marks Distribution						Total
		L/T	P/D	CLP	CR	Theory			Practical			
						IA	SEE	Total	IA	SEE	Total	
MAOT 4.1	Clinical Medicine & critical care management	5	1	1	7	20	80	100	20	80	100	200
MAOT 4.2	Dissertation evaluation	--	--	8	8	--	---	--	-	100	100	100
	GRAND TOTAL	**5**	**1**	**9**	**15**							**300**

MAOT4.1 – CLINICAL MEDICINE & CRITICAL CARE MANAGEMENT

L/T	P/D	CLP	C
5	1	1	7

LEARNING OBJECTIVES

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

1. Understand ICU setup, emergency care and patient transport systems
2. Apply knowledge of monitoring techniques in critically ill patients
3. Provide basic and advanced life support in emergency situations
4. Understand ventilatory support and respiratory care management
5. Apply infection control and patient safety practices in ICU.

COURSE OUTCOMES (COs)

CO1: Understand universal precautions and infection control practices
CO2: Monitor and report patient vital signs using various monitoring systems
CO3: Understand ICU procedures, techniques and patient management
CO4: Provide general care, nutrition and respiratory support in ICU patients
CO5: Identify and manage hospital-acquired infections
CO6: Participate in disaster management and triage systems

UNIT I

BASIC LIFE SUPPORT, ACLS & FIRST AID **20 HOURS**

First aid for unconscious patients

- Principles, aims and rules of first aid
- First aid box components

- Advanced Trauma Life Support (ATLS) basics

- Cardio Pulmonary Resuscitation (CPR)
- Basic Life Support (BLS)
  - Algorithm
  - Mouth-to-mouth ventilation
  - Chest compressions
- Advanced Cardiac Life Support (ACLS)
  - Defibrillation
  - Vascular access
  - Airway management
  - Foreign body obstruction
  - Emergency drugs
- CPR in infants and children
- Complications of BLS

UNIT II

ICU MONITORING & VENTILATOR SUPPORT **20 HOURS**

- ICU monitoring techniques
  - Invasive blood pressure monitoring
  - Transoesophageal Doppler
  - Central venous pressure monitoring
  - Pulmonary artery catheterization
  - Arterial blood gas (ABG) analysis
- Ventilator life support
  - Types of ventilators
  - Mechanical ventilation modes
  - Ventilator settings and management
  - Ventilation-induced lung injury
  - Ventilator monitoring
  - Weaning strategies
  - SAT and SBT trials
  - Non-conventional ventilation

UNIT III

ICU CARE, FLUID MANAGEMENT & PATIENT SAFETY **12 HOURS**

Intubation and tracheostomy care

- Spirometry and data interpretation
- Fluid therapy and electrolyte management
- Infection control in ICU
- Transport of critically ill patients
- Investigations in ICU
- Patient safety bundles
  - Ventilator care bundle
  - Central line bundle
  - Sepsis bundle

UNIT IV

DISASTER MANAGEMENT & TRIAGE **10 HOURS**

Hospital disaster preparedness

- Disaster planning and coordination
- Communication and documentation
- Medico-legal aspects
- Safety and security systems
- Human resource management in disasters
- Triage systems
- Post-disaster recovery
- Patient handling protocols

UNIT V

NEUROLOGICAL MONITORING & SHOCK MANAGEMENT **13 HOURS**

Neurological assessment

  - Glasgow Coma Scale
  - Sedation scoring systems
- Shock and multisystem failure
  - Sepsis and septic shock
  - Hemorrhagic shock
  - Neurogenic shock
  - Anaphylactic shock
  - Acute Lung Injury (ALI)
  - ARDS
  - Multi-Organ Dysfunction Syndrome (MODS)

PRACTICAL / DEMONSTRATION **(30 HOURS)**

- Invasive monitoring setup
  - ABP, CVP, ICP, IAP, PA catheter
- Transoesophageal Doppler setup
- Arterial blood gas sampling and interpretation
- Ventilator setup and management
- ICU infection control practices
- Hand hygiene and universal precautions
- Emergency patient transport
- BLS, ACLS, ATLS training
- Defibrillator use

REFERENCE BOOKS:

1. Civetta, Taylor & Kirbey‟s Critical care
2. Critical care- Paul Marino
3. The ICU book-Schumacher

MAOT4.2 – DISSERTATION /PROJECT WORK

L/T	P/D	CLP	C
0	0	8	8

TOTAL HOURS - 360

LEARNING OBJECTIVES

At the end of the dissertation/project work, the student will be able to:

1. Identify a relevant clinical or academic research problem
2. Review and analyze existing literature and recent advances
3. Formulate a clear research hypothesis and objectives
4. Design an appropriate research methodology
5. Apply basic biostatistical methods for data analysis
6. Collect, organize, interpret, and present research data

COURSE OUTCOMES (COs)

At the end of the course students will be able to:

CO1: Develop the ability to apply research methodology while working on a project work
CO2: Describe appropriate statistical methods required for different research designs
CO3: Select suitable research design and develop a research hypothesis for a project
CO4: Develop a structured framework for conducting scientific research studies

LEARNING OBJECTIVES

- Understand the principles and process of research methodology.
- Identify and formulate a suitable research problem in Anaesthesia and Operation Theatre Technology.
- Conduct review of literature using scientific sources and journals.
- Develop research objectives, hypotheses, and appropriate study designs.
- Apply suitable methods for data collection, analysis, and interpretation.
- Use appropriate statistical techniques in biomedical research.
- Prepare and organize dissertation work according to university guidelines.

AREAS OF RESEARCH

- Airway management techniques
- Regional anaesthesia and pain management
- General anaesthesia practices
- Operation theatre management and safety
- Infection control and sterilization practices
- Monitoring techniques in anaesthesia and critical care
- Difficult airway management
- Ventilator management and respiratory care
- Post-operative pain management
- Critical care and emergency management
- Patient safety and quality assurance in OT and ICU
- Anaesthesia equipment maintenance and troubleshooting
- Biomedical waste management in OT and ICU
- Ultrasound-guided procedures in anaesthesia

• Anaesthesia for specialty surgeries.Evidence-based practices in Anaesthesia and Operation Theatre Technology.

DISSERTATION ACTIVITIES

- Selection of research topic
- Review of literature
- Preparation of research proposal
- Ethical committee approval
- Data collection and documentation
- Statistical analysis and interpretation
- Dissertation writing and formatting
- Preparation of presentation and viva voce

EVALUATION METHODS

- Synopsis, Dissertation submission and evaluation
- External examiner assessment
- Viva voce examination
- Research presentation and defense