MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A++' Accredited by NAAC
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CHOICE BASED CREDIT SYSTEM

(CBCS)

(with effect from 2025-26 Batches)

Curriculum for

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

Amended as per AC-51/2025, Dated 29/04/2025

Amended History

1. Amended as per AC-51/2025, [Resolution No.3.1(Annexure-3.9)], [Resolution No.3.5, (Annexure-7)]; Dated 29/04/2025.

Resolution No. 3.1 of Academic Council (AC-51/2025):

Resolved to approve the CBCS syllabus, including Program Outcomes (POs), Course Outcomes (COs), and PO -CO Mapping for 15 two-year postgraduate programs under MGMSBS for Semesters I and II. These include: M. Sc. Medical Biotechnology, M.Sc. Medical Genetics, M.Sc. Clinical Embryology, M.Sc. Clinical Nutrition, M.Sc. Medical Dialysis Technology, M.Sc. Molecular Biology, M.Sc. Medical Radiology & Imaging Technology, M.Sc. Cardiac Care Technology , **M.Sc. Operation Theatre and Anaesthesia Technology** , M.Sc. Emergency and Trauma Care , M. Optometry , Master in Hospital Administration , Master of Public Health , M.Sc. Health Informatics & M.Sc. Clinical Research to be effective from batch admitted in Academic Year 2025-26 onwards [ANNEXURE-3.1 to 3.30].

Annexure-3.9 of AC-51/2025

MGM SCHOOL OF BIOMEDICAL SCIENCES, NAVI MUMBAI

(A constituent unit of MGM INSTITUTE OF HEALTH SCIENCES)

(Deemed to be University u/s 3 of UGC Act 1956)

Grade "A^{++}" Accredited by NAAC

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CHOICE BASED CREDIT SYSTEM (CBCS)

(Academic Year 2025 - 26)

Curriculum for

M.Sc. Allied Health Sciences

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

Semester I & II

DIRECTOR'S MESSAGE

Welcome Message from the Director

Dear Postgraduate Students,

Welcome to **MGM School of Biomedical Sciences (MGMSBS), MGMIHS**, a premier institution dedicated to advancing allied and health sciences education. As you embark on this transformative academic journey, you are joining a community that fosters excellence in research, clinical expertise, and innovation**.**

MGMIHS, accredited with **NAAC 'A^{++}' Grade (CGPA 3.55, 2022)** and recognized as a **Category I Institution by UGC**, offers an ecosystem that nurtures both academic and professional growth. With **NIRF (151-200 rank band) recognition, NABH-accredited hospitals, NABL-accredited diagnostic labs, and JCI accreditation for MGM New Bombay Hospital**, we uphold global benchmarks in education and healthcare.

At MGMSBS, our **15 postgraduate programs** are meticulously designed to align with the National Commission for Allied and Healthcare Professionals **(NCAHP)** standards**,** National Education Policy **(NEP)** 2020**,** and the National Credit Framework **(NCrF).** We have implemented the **Choice-Based Credit System (CBCS)** to provide academic flexibility while ensuring rigorous training in clinical and technical skills**.** Our state-of-the-art research laboratories, digital classrooms, and the Central Research Laboratory (CRL) foster an environment that encourages innovation and evidence-based learning**.**

Postgraduate education at MGMSBS goes beyond theoretical learning—our curriculum integrates **hands-on clinical training, interdisciplinary collaboration, and exposure to real-world healthcare challenges**. We emphasize **research-driven education**, encouraging students to actively participate in **scientific discoveries, publications, and international collaborations**.
Beyond academics, we believe in **holistic development**, with initiatives such as the **AARAMBH Science and Wellness Club**, which promotes **mental well-being, leadership, and professional networking**.

As you step into this **next phase of academic and professional growth**, we encourage you to explore new ideas, engage in impactful research, and contribute meaningfully to the **healthcare ecosystem**. We are confident that your journey at MGMSBS will shape you into **skilled, compassionate, and visionary professionals**, ready to lead in the ever-evolving healthcare landscape.

We look forward to witnessing your achievements and contributions!

Dr. Mansee Thakur
Director, MGM School of Biomedical Sciences
MGM Institute of Health Sciences, Navi Mumbai

ABOUT MGM SCHOOL OF BIOMEDICAL SCIENCES

Mission

To improve the quality of life, both at individual and community levels by imparting quality medical education to tomorrow's doctors and medical scientists and by advancing knowledge in all fields of health sciences though meaningful and ethical research.

Vision

Bytheyear2022, MGM Institute of Health Sciences aims to be top-ranking Centre of Excellence in Medical Education and Research. Students graduating from the Institute will have the required skills to deliver quality health care to all sections of the society with compassion and benevolence, without prejudice or discrimination, at an affordable cost. As a research Centre, it shall focus on finding better, safer and affordable ways of diagnosing, treating and preventing diseases. In doing so, it will maintain the highest ethical standards.

About–School of Biomedical Sciences

MGM School of Biomedical Sciences is formed under the aegis of MGM IHS with the vision of offering basic Allied Science and Medical courses for students who aspire to pursue their career in the Allied Health Sciences, teaching as well as research.

School of Biomedical Sciences is dedicated to the providing the highest quality education in basic medical sciences by offering a dynamic study environment with well-equipped labs. The school encompasses 23 courses each with its own distinct, specialized body of knowledge and skill. This includes 8 UG courses and 15 PG courses. The college at its growing years started with mere 100 students has recorded exponential growth and is now a full-fledged educational and research institution with the student strength reaching approximately **800** at present.

Our consistent theme throughout is to encourage students to become engaged, be active learnersandtopromotemedicalresearchsothatultimatelytheyacquireknowledge,skills,andunderstanding so as to provide well qualified and trained professionals in Allied Health Sciences to improve the quality of life.

As there is increased need to deliver high quality, timely and easily accessible patient care system the collaborative efforts among physicians, nurses and allied health providers become ever more essential for an effective patient care. Thus the role of allied health professionals in ever-evolving medical system is very important in providing high-quality patient care.

Last but by no means least, School of Biomedical Sciences envisions to continuously grow and reform. Reformations are essential to any growing institution as it fulfills our bold aspirations of providing the best for the students, for us to serve long into the future and to get ourselves up dated to changing and evolving trends in the health care systems.

Name of the Degree: M.Sc. Operation Theatre & Anesthesia Technology

Duration of Study:

The duration of the study for M.Sc. Operation Theatre & Anesthesia Technology will of 2 years.

Eligibility Criteria:

Candidate should be minimum B.Sc. Operation Theater & Anesthesia Technology/ B.Sc. Anesthesia & Critical Care Technology / B.Sc. Operation Theater Technology with minimum 50% marks in qualified examination.

Medium of Instruction:

English shall be the Medium of Instruction for all the Subjects of study and for examinations.

For any query visit the website: www.mgmsbsnm.edu.in/www.mgmuhs.com

M.Sc. Operation Theatre & Anesthesia Technology

Program Outcomes (PO)

Program Code	Program Outcome
PO1	Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
PO2	Develop the ability of critical thinking to analyze, interpret problems and to find out systematic approach for solution.
PO3	Impart decision making capability for handling various circumstances in their respective areas
PO4	Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
PO5	Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
PO6	Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
PO7	Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research in respective areas of specialization
PO8	Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

Program Specific Outcome (PO)

Program Code	Program Outcome
PO1	Students will be competent to work in Hospital Operation Theatres, Critical Care Units and Emergency sections.
PO2	Students will be skilled in problem solving, critical thinking and will be able to assist the Surgeon or Anesthetist.
PO3	The students will acquire in-depth knowledge of Anesthesia, Surgery, Critical care pain Management.
PO4	Students will be able to have all the relevant knowledge of Anesthesia & Surgery and will be able to do various procedures required.
PO5	This Program will create a great source of manpower which can aid in our health sector especially in Trauma, Emergency, ICU & Operation Theatres.
PO6	Students will be able to explore new areas of research in both Anesthesia & Surgery and can also go for research as well.
PO7	Students will be able to integrate knowledge of various types of Surgical Procedures & Anesthetic procedures along with their in-depth knowledge.

Learning Objective

Sr. No.	Learning Objective
At the end of completion of M.Sc. OTAT student shall achieve following skills	
1	Students shall learn and work as a link between OT Sisters and Doctor in OT.
2	Learn to prepare the OT prior to surgery, including anaesthesia preparation and Surgical Preparation.
3	Shall be trained in sterilization of OT and instruments.
4	Learn to prepare the OT prior to surgery, including anaesthesia preparation and Surgical Preparation.
5	Shall be trained in sterilization of OT and instruments.
6	Assist the Anaesthetist in delivering General anaesthesia and Regional anaesthesia.
7	Assist in common Surgeries as second SOS first assistant in emergency.
8	Shall be trained in performing basic nursing procedures like IV Catheterization, RT insertion, Nebulisation, Oxygen therapy, Injections.
9	Shall be trained in monitoring of the patient in pre-op and post-op room.
10	Shall be trained in Cardio-pulmonary resuscitation.
11	Shall be trained in use a defibrillator correctly during Cardio-pulmonary resuscitation.
12	Shall be trained in use of basic monitors, equipment's and C-arm in OT.
13	Shall be informed regarding maintenance of basic monitors, equipment's and C-arm in OT including sterilization of endoscopes.
14	Shall be trained in maintenance of all OT records in a proper way.
15	Shall be trained in Blood transfusion therapy.
16	Shall be trained in monitoring of the patient during Blood transfusion.
17	Shall be trained in monitoring of parameters as per check list before & after surgery.
18	Shall be trained in communication skills to provide psychological support to the patient.
19	Shall be trained in counselling patients' relatives.
20	Shall be trained in management of common accidents and untoward incidences in OT.
21	Shall be trained in managing the Arthroscopy unit.

22	Shall be trained in performing different injection techniques commonly used in OT.
23	Shall be trained in checking availability of emergency drugs in emergency tray in the OT.
24	Shall be trained in taking BP and Pulse of patients.
25	Shall be trained in verifying IPD papers for Preoperative preparation NBM status and consent for surgical procedure.
26	Shall be trained in preparation of dressing pads, swabs and packs.
27	Shall be trained in packing of drums for sterilization.
28	Shall be trained in observation of patient during surgery and postoperative period.
29	Shall be trained in segregation of biomedical waste.
30	Shall be trained in preparation of electric gadgets such as Laparoscope, cautery etc.
31	Shall be trained in monitoring of Central suction, electric suction machines and foot suction machines.
32	Shall be trained in Checking whether OT lists are signed by authorities.
33	Shall be trained in ensuring availability of anaesthesia disposables such as ETT, Tracheostomy tray, airways, laryngoscopes with all blades, connectors, styles, spinal and epidural tray, defibrillators, ventilators etc.
34	Shall be trained in ensuring availability of IV anaesthetics such as Thiopentone, propofol, ketamine and muscle Relaxants such as suxamethonium, pancuronium, atracurium, vecuronium. Local anaesthetics such as lignocaine, Bupivacaine etc.
35	Shall be trained in colour coding of various types of cylinders.
36	Shall be trained in monitoring of central oxygen system, manifolds, liquid oxygen, and measurement of pressures in Oxygen cylinders.
37	Shall be trained in use of fire extinguishers.
38	Shall be trained in various positions of operation table and their indications.
39	Shall be trained in inventories of various OT equipment's, instruments, consumables and disposables including indents, opening and closing balances.
40	Shall be trained in technical work as well as paper work equally.

Semester I

MOTAT 101 T	Applied Anatomy & Physiology	Mapped PO	Teaching-Learning Methodology	Assessment Tools
CO1	Explain the structure and function of the human body in relation to healthcare practices.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Quiz	Theory exam, Practical exam, Viva-voce, Seminar
CO2	Analyze physiological mechanisms and their relevance to clinical applications.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Quiz	Theory exam, Practical exam, Viva-voce, Seminar
CO3	Apply anatomical and physiological concepts to patient care and medical procedures.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Quiz	Theory exam, Viva-voce, Seminar, Log Book, Case-study
MOTAT 102 T	**Pre-operative Assessment & Optimizations Strategies**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Identify key pre-operative assessment parameters to ensure patient safety.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, Role-Play, Videos	Theory exam, Viva voce, Seminar, Skill assessment, Case-study presentation
CO2	Analyze risk factors and develop optimization strategies for surgical interventions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Group Discussion, Problem-Based Learning (PBL)	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Demonstrate decision-making skills in managing pre-operative patient conditions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Group Discussion, Seminar, Workshops, Demonstration	Practical Exam, Station Exercise, Log book, Seminar Presentation, Skill assessment
MOTAT 103 T	**Surgical Equipments & Technology**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Describe the working principles of various surgical instruments and technologies.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Experiential, Industrial visit	Theory Exam, Practical Exam, Assignment, Skill assessment
CO2	Demonstrate safe handling and maintenance of surgical equipment.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Experiential, Industrial visit	Theory Exam, Practical Exam, Assignment, Skill assessment
CO3	Apply knowledge of surgical technology in clinical and emergency settings.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Experiential, Industrial visit	Theory Exam, Practical Exam, Assignment, Skill assessment

CC 001 T	Research Methodology & Biostatistics (Core Course)	Mapped PO	Teaching-Learning Methodology	Assessment Tools
CO1	Understand the fundamentals of research methodology and biostatistics.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO2	Apply statistical tools to analyze healthcare data and interpret research findings.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Develop research proposals addressing healthcare challenges.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
MOTAT 104 P	**Pre-operative Assessment & Optimisation Strategies**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Identify key pre-operative assessment parameters to ensure patient safety.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, Assignment,	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Journal
CO2	Analyze risk factors and develop optimization strategies for surgical interventions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, Assignment	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Journal
CO3	Demonstrate decision-making skills in managing pre-operative patient conditions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, Assignment	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Journal
MOTAT 105 P	**Surgical Equipments & Technology**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Describe the working principles of various surgical instruments and technologies.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, , Industrial Visit, Assignment	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Journal
CO2	Demonstrate safe handling and maintenance of surgical equipment.	PO1, PO2, PO3, PO4, PO5,PO6,	Lecture, Practical, Demonstration, , Industrial Visit,	Internal Exam, University Exam, (Theory Exam)

		PO7, PO8	Assignment	Seminar, Station Exercise / OSCE Assignment, Journal
CO3	Apply knowledge of surgical technology in clinical and emergency settings.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Demonstration, , Industrial Visit, Assignment	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Journal
MOTAT 106 CP	**MOTAT Directed Clinical Education - I**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Demonstrate fundamental skills in OT and anesthesia procedures.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Practical, Flip Classroom, Problem-Based Learning (PBL)	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Log book
CO2	Assist in preoperative and intraoperative patient care.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Experiential, Workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
C03	Apply infection control and sterilization protocols in clinical settings.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Experiential, Workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CC 001 P	**Research Methodology & Biostatistics**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Understand the fundamentals of research methodology and biostatistics.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO2	Apply statistical tools to analyze healthcare data and interpret research findings.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Develop research proposals addressing healthcare challenges.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, E-Learning, workshops	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment

SEMESTER II

MOTAT 107 T	Anaesthetic Equipments & Procedures	Mapped PO	Teaching-Learning Methodology	Assessment Tools
CO1	Explain the principles and functioning of anaesthetic equipment.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Quiz, Flip classroom	Theory exam, Practical exam, Viva-voce, Seminar
CO2	Demonstrate proper handling and maintenance of anaesthetic devices.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, PBL, Assignment	Theory exam, Viva-voce, Seminar, Log Book
CO3	Apply anaesthesia techniques based on clinical requirements.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Group Discussion	Theory exam, Viva-voce, Seminar, Log Book, Case-study
MOTAT 108 T	**Advanced Anaesthesia Techniques**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Understand advanced anaesthesia techniques for different surgical procedures.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Practical, Quiz, Seminar	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO2	Analyze patient responses and modify anesthetic plans accordingly.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Workshops, Case-Study, Lecture, Practical, Demonstration	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Demonstrate proficiency in administering specialized anaesthesia methods.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Workshops, Case-Study, Lecture, Practical, Demonstration	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
MOTAT 109 T	**Concept of Disease In Relation To Anesthesia & Critical Care**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Explain the pathophysiology of critical illnesses and their impact on patient management.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Problem Based learning, Group Discussion, Practical	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO2	Analyze clinical conditions requiring critical care interventions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Problem Based learning, Group Discussion, Practical	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Demonstrate decision-making skills in managing critically ill patients.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Problem Based learning, Group Discussion, Practical	Internal Exam, University Exam, (Theory Exam) Seminar,

				Assignment
MOTAT 110 P	**Anaesthetic Equipments & Procedures**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Explain the principles and functioning of anaesthetic equipment.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
CO2	Demonstrate proper handling and maintenance of anaesthetic devices.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
CO3	Apply anaesthesia techniques based on clinical requirements.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
MOTAT 111 P	**Concept of Disease In Relation To Anesthesia & Critical Care**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Explain the pathophysiology of critical illnesses and their impact on patient management.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lectures, Guest Lecture, Case Study, Seminar	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
CO2	Analyze clinical conditions requiring critical care interventions.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lectures, Guest Lecture, Case Study, Seminar	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
CO3	Demonstrate decision-making skills in managing critically ill patients.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lectures, Guest Lecture, Case Study, Seminar	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE journal
MOTAT 112 CP	**MOTAT Directed Clinical Education - II**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Manage anesthesia and surgical equipment effectively.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Log book

CO2	Assist in advanced anesthesia and OT procedures.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Log book
C03	Evaluate and respond to critical situations in the operation theatre.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Demonstration, Experiential, Industrial visit, Problem-Based Learning (PBL), Experiential	Internal Exam, University Exam, (Theory Exam) Seminar, Station Exercise / OSCE Assignment, Log book
SEC 001 T	**Innovation and Entrepreneurship**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Develop an entrepreneurial mindset in the healthcare sector.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Guest lecture, Industrial visit, Group Discussion, Internship	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO2	Apply innovation strategies to improve medical practices and patient care.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Guest lecture, Industrial visit, Group Discussion, Internship	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
CO3	Demonstrate business planning and problem-solving skills in healthcare startups.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Guest lecture, Industrial visit, Group Discussion, Internship	Internal Exam, University Exam, (Theory Exam) Seminar, Assignment
SEC 002 T	**One Health (NPTEL)**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Understand the interconnectedness of human, animal, and environmental health in a global context.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Quiz, Assignment, E-learning	Online NPTEL MCQ test
CO2	Analyze the impact of zoonotic diseases and antimicrobial resistance on public health and ecosystems.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Quiz, Assignment, E-learning	Online NPTEL MCQ test
CO3	Evaluate policies and strategies for disease prevention and sustainable development within the One Health framework.	PO1, PO2, PO3, PO4, PO5,PO6, PO7, PO8	Lecture, Quiz, Assignment, E-learning	Online NPTEL MCQ test

OUTLINE OF COURSE CURRICULUM

M.Sc. Operation Theatre and Anaesthesia Technology

Semester I

Code No.	Core Course	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation (CP)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation (CP)	Total (hrs.)	Internal Assement (IA)	Semester End Exam (SEE)	Total
Discipiline Specific Core Theory														
MOTAT 101 T	Applied Anatomy & Physiology	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 102 T	Pre-operative Assessment &Optimisation Strategies	3	-	-	-	**3**	45		-	-	**45**	**20**	**80**	**100**
MOTAT 103 T	Surgical Equipments & Technology	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
CC 001 T	Research Methodology & Biostatistics (Core Course)	3	-	-	-	**3**	45	-	-	-	**45**	-	**50**	**50**
Discipiline Specific Core Practical														
MOTAT 104 P	Pre-operative Assessment &Optimisation Strategies	-	-	4	-	**2**	-	-	60	-	**60**	**10**	**40**	**50**
MOTAT 105 P	Surgical Equipments & Technology	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
MOTAT 106 CP	MOTAT Directed Clinical Education-I	-	-	-	12	**4**	-	-	-	180	**180**	-	**50**	**50**
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	**2**	-	-	60	-	**60**	-	**50**	**50**
Total		**12**	**0**	**10**	**12**	**21**	**180**	**0**	**150**	**180**	**510**	**80**	**470**	**550**

OUTLINE OF COURSE CURRICULUM

M.Sc. Operation Theatre and Anaesthesia Technology

Semester II

Code No.	Core Course	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation (CP)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation (CP)	Total (hrs.)	Internal Assement (IA)	Semester End Exam (SEE)	Total
Discipiline Specific Core Theory														
MOTAT 107 T	Anaesthetic Equipments & Procedures	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 108 T	Advance Anesthesia Techniques	3	-	-	-	**3**	45		-	-	**45**	**20**	**80**	**100**
MOTAT 109 T	Concept of Disease In Relation To Anesthesia And Critical Care	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
Discipiline Specific Core Practical														
MOTAT 110 P	Anaesthetic Equipments & Procedures	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
MOTAT 111 P	Concept of Disease In Relation To Anesthesia And Critical Care	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
MOTAT 112 CP	MOTAT Directed Clinical Education-II	-	-	-	18	**6**	-	-	-	270	**270**	-	**50**	**50**
Skill Ehancement Course														
SEC 001 T	Innovation and Enterprenuarship	3	-	-	-	**3**	45	-	-	-	**45**	-	**100**	**100**
SEC 002 T	One Health (NPTEL)													
Total		**12**	**0**	**4**	**18**	**20**	**180**	**0**	**60**	**270**	**510**	**80**	**470**	**550**

FIRST YEAR

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

SEMESTER-I

Code No.	Core Subjects
Discipline Specific Core Theory	
MOTAT 101 T	Applied Anatomy & Physiology
MOTAT 102 T	Pre-operative Assessment & Optimisation Strategies
MOTAT 103 T	Surgical Equipments & Technology
CC 001 T	Research Methodology & Biostatistics (Core Course)
Discipline Specific Core Practical	
MOTAT 104 P	Pre-operative Assessment & Optimisation Strategies
MOTAT 105 P	Surgical Equipments & Technology
MOTAT 106 CP	MOTAT Directed Clinical Education - I
CC 001 P	Research Methodology & Biostatistics (Core Course)

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester I**
Name of the Course	**Applied Anatomy & Physiology**
Course Code	**MOTAT 101 T**

Learning Outcome	• Provide foundational knowledge of human anatomy and physiology relevant to surgical procedures. • Explain physiological responses to anesthesia and surgical interventions. • Enhance understanding of body systems and their clinical applications.
Course Outcomes	• Explain the structure and function of the human body in relation to healthcare practices. • Analyse physiological mechanisms and their relevance to clinical applications. • Apply anatomical and physiological concepts to patient care and medical procedures.

Sr. No	TOPICS	No. of Hrs.
1	**RESPIRATORY 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, and bronchospasm. Alveoli - Layers, Surfactants Respiratory Physiology Control or breathing Respiratory muscles - diaphragm, intercostals.	**9**
2	**LUNG VOLUMES** Dead space, vital capacity, FRC , Pulmonary Function Tests Pleural cavity - intrapleural 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 oedema, pulmonary hypertension	**9**
3	**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. Blood Pressure & tissue perfusion, Pulse pressure Myocardial infarction	**8**
4	**NERVOUS SYSTEM** Organization of nervous system, Neuron, Classification and properties of nerve fiber, electrophysiology. Neuromuscular Junction: Action potential, nerve impulse, receptors, synapse, neurotransmitters. Action of Muscle Relaxants on Neuromuscular Junction. Autonomic Nervous System- Sympathetic and Parasympathetic Nervous system Brain, Spinal cord, CSF, Brain Stem	**9**

	Cranial Nerves	
5	**Hepatic system** Anatomy of Liver, Lobes and Blood Supply Functions of Liver, Functional division of Liver Histology- Liver Lobules Pressure Flow Autoregulation	**6**
6	**Renal System** Structure and Function of Kidney, Nephron, Juxtaglomerular Apparatus Renal Circulation	**4**
Total		**45 hrs**

Reference:

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

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester I**
Name of the Course	**Pre-operative Assessment & Optimisation Strategies**
Course Code	**MOTAT 102 T**

Learning Outcome	• Train students in systematic preoperative patient evaluation. • Develop decision-making skills for optimizing patient conditions before surgery. • Familiarize students with risk assessment and patient preparation protocols.
Course Outcomes	• Identify key pre-operative assessment parameters to ensure patient safety. • Analyse risk factors and develop optimization strategies for surgical interventions. • Demonstrate decision-making skills in managing pre-operative patient conditions.

Sr. No	Topics	No. of Hrs.
1	**Preoperative Preparation** History Taking - Chief complaints, present illness, Past history, Personal history, Family history, Birth history, immunization. Medications therapies, Allergy, Occupation, Social status, Previous Surgeries & Anesthesia. Deep breathing exercises- Exercises, physiotherapy, Chest physiopostural drainage. Weight reduction, Counseling soft surgical diet, Bowel preparation. Medications- Drugs to be discontinued/ stopped, Drugs to be continued. Oral & dental hygiene.	**8**
2	ASA grading, its interpretation and importance. Airway assessment - Mallampatti, Wilson, IDL, Cormack and Lehane, thyromental, interinusm gap, anterior mandibular protusion, cervical spine extension, sternomental distance.	**4**
3	Routine investigations- Routine tests & their importance. Hemogram, Urine routine and microscopic, Blood sugar, Hematocrit, Serum lectrolytes.	**4**
4	Cardiac fitness indices- Goldman Parsonnet, cardiac risk factors, NYHA, METs, Charlson's comorbidity index. Patient with cardiac diseases- - 3D Echo, 12 Lead EKG, stress test Thallium, coronary angio, CT angio, transeosophageal echo, CT thorax, arterial blood gas, cardiac catheterization, cardiac markers, lipid profile.	**4**
5	Neurological Assessment - Glasgow coma scale. Patient with neurological diseases. X-Ray skull, CT/ MRI brain, CSF studies.	**4**
6	Respiratory predictors- smoking, increasing age, increasing BMI. Respiratory diseases- Chest X-Ray, CT/ MRI thorax, Spirometry, arterial blood gases, sputum studies, fluoroscopy, tracheobronchoscopy, flow volume loops.	**4**
7	Patient with liver diseases- Child's criteria, Puglis modification. Liver Function Test, USG abdomen, ascetic fluid studies INR	**5**

8	Patient with kidney diseases – Kidney Function Test, 5 stages of failure depending on GFR. Urine analysis, x-ray kidney, ureter, bladder, CT&MRI- kidney, ureter, bladder, USG kidney, ureter, bladder.	**6**
9	Trauma - Shock grades, RTS.	**3**
10	MEWS- Modified Early Warning Score Emergency Nature	**3**
Total		**45 hrs**

MOTAT 104 P: Pre-operative Assessment & Optimisation Strategies

Sr. No.	Topics	No. of Hrs.
1	History Taking - Chief complaints, present illness, Past history, Personal history, Family history, Birth history, immunization. Medications therapies, Allergy, Occupation, Social status, Previous Surgeries & Anesthesia.	**60**
2	ASA grading, its interpretation and importance. Airway assessment - Mallampatti, Wilson, IDL, Cormack and lehane, thyromental, interinusm gap, anterior mandibular protusion, cervical spineextension, sternomental distance.	
3	Routine investigations- Routine tests & their importance. Hemogram, Urine routine and microscopic, Blood sugar, Hematocrit, Serum electrolytes.	
4	Cardiac Fitness Index - Goldman Parsonnet, cardiac risk factors, NYHA, METs, Charlson's comorbidity index. Patient with cardiac diseases - 3D Echo, 12 Lead EKG, stress test Thallium, coronaryangio, CT angio, transeosophageal echo, CT thorax, arterial blood gas, cardiac catheterization, cardiac markers, lipid profile	
5	Neurological Assessment - Glasgow coma scale. Patient with neurological diseases. X-Ray skull, CT/ MRI brain, CSF studies	
Total		**60 hrs**

Reference:

- **Lee's synopsis**
- **Short text book of anesthesia**

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester I**
Name of the Course	**Surgical Equipments & Technology**
Course Code	**MOTAT 103 T**

Learning Outcome	• Introduce students to various surgical instruments and their functions. • Train in the safe handling and maintenance of surgical and anesthesia equipment. • Ensure understanding of sterilization techniques and safety compliance.
Course Outcomes	• Describe the working principles of various surgical instruments and technologies. • Demonstrate safe handling and maintenance of surgical equipment. • Apply knowledge of surgical technology in clinical and emergency settings.

Sr. No.	Topics	No. of Hrs.
1	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.	**8**
2	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	**8**
3	Preparation of laparoscopic instruments; cleaning and care of laparoscopic instruments; Incision and its types, instruments used for general surgery, orthopedic surgical instruments, Genecology procedure instruments major abdominal incision, minor surgical procedure instruments.	**8**
4	Operating tables; Suction machine; Diathermy machine; microscopes; Operating lights; Operating trolleys.	**5**
5	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.	**8**
6	Types of Operation table and positions, use of Diathermy machine, use of Suction machine, Types of jars, Suction tubes, emergency lights, checking and arranging of instruments on the table, instrument trolleys	**8**
Total		**45 hrs**

MOTAT 105 P: Surgical Equipment's & Technology

Sr. No.	Topics	No. of Hrs.
1	Observation & Demonstration of Preparation of OT for surgery.	30
2	Methods of sterilization in OT- Autoclaving, Fumigation Uses of O.T equipments.	
3	Surgical Incision technique.	
4	Suture materials. Suturing Types- Simple, Mattress, Subcuticular etc.	
5	Dressing Procedure Drain Types & Uses. Handling of Instruments.	
Total		**30 hrs**

Name of the Program	M.Sc. Operation Theatre & Anesthesia Technology
Semester	Semester I
Name of the Course	Research Methodology & Biostatistics (Core Course)
Course Code	CC 001 T

Teaching Objective	• The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive, understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyze the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	• Understand the fundamentals of research methodology and biostatistics. • Apply statistical tools to analyse healthcare data and interpret research findings. • Develop research proposals addressing healthcare challenges.

Sr. No.	Topic	No. of Hrs.
A	**Research Methodology:**	**23**
1	**Scientific Methods of Research**: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research, Research Methods versus Methodology	4
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case – Control Studies, Cross-sectional studies, Intervention studies.	5
3	**Sampling Designs**: Census and Sample Survey, Need and importance for Sampling, Implications of a Sample Design, Different Types of Sample Designs (Probability sampling and non-probability sampling), Systematic sampling, Stratified sampling, Cluster sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	**Measurement in research**: Measurement Scales, Sources of Error in Measurement,	3
5	**Methods of Data Collection**: Types of data, Collection of Primary Data, Observation Method, Interview Method	4
6	Research Ethics and plagiarism	2
B	**Biostatistics**	**22**
7	**Data Presentation**: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, scatter plots, line graphs	3
8	**Measures of Central Tendency and Dispersion**: Mean, Median, Mode, Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, power of test, Normal distribution, Parametric Tests including Z-test, t-test, and ANOVA	4
10	**Chi-square Test**: Chi-square as a Non-parametric Test, Applications.	2
11	**Measures of Relationship**: Correlation and Simple Regression Analysis	3

12	**Non-parametric test**: Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test, Kruskal Walli's test, Friedman's test, and Spearman Rank correlation test.	3
13	**Vital Health Statistics**: rate, crude rate, age specific rate, Measurement of fertility, Rate, Measures of mortality.	4
Total		**45 hrs**

CC 001 P–Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs.
A	**Research Methodology**	
1	Research Article Presentation (Seminar)	**5**
B	**Biostatistics**	
2	Data Presentation	**4**
3	Measures of Central Tendency and Dispersion	**6**
4	Testing of Hypotheses	**16**
5	Chi-square Test	**4**
6	Measures of Relationship	**6**
7	Analysis of Variance	**5**
8	Non parametric or Distribution-free Tests	**8**
9	Computer Application Using Statistical Software including SPSS	**6**
Total		**60 hrs**

Reference Books:

1. Daniel WW. Biostatistics: A foundation for analysis in the health sciences. 10th ed. Wiley; 2013.
2. Gupta SC, Kapoor VK. Fundamentals of mathematical statistics. Sultan Chand & Sons; 2020 Sep.
3. Kothari CR, Garg G. Research methodology: Methods and techniques.2019.
4. Mahajan BK. Methods in biostatistics for medical students and research workers. 7th ed. Jaypee Brothers Medical Publishers; 2010.
5. Murthy MN. Sampling theory and methods. Statistical Publishing Society; 1967.
6. Singh YK. Fundamental of research methodology and statistics. New Age International; 2006.

Resolution No. 3.5 of Academic Council (AC-51/2025):

Resolved to approve the submitted list of recommended books for M.Sc. Clinical Nutrition and the course on **Biostatistics and Research Methodology** [ANNEXURE-7].

Annexure-7 of AC-51/2025

Biostatistics & Research Methodology Books List

Subject	Book Name	Author
Biostatistics & Research Methodology	Biostatistics: A Foundation for Analysis in the Health Sciences (10th ed.)	Daniel WW.
	Biostatistical Analysis (5th ed.)	Zar JH.
	Research Methodology: Methods and Techniques	Kothari CR, Garg G.
	Methods in Biostatistics for Medical Students and Research Workers (7th ed.)	Mahajan BK.
	Sampling Theory and Methods	Murthy MN.
	Fundamentals of Research Methodology and Statistics	Singh YK.
	Fundamentals of Biostatistics (8th ed.)	Rosner B.
	An Introduction to Medical Statistics (4th ed.)	Bland M.

MOTAT 106 CP: MOTAT Directed Clinical Education – I

Course Outcomes	• Demonstrate fundamental skills in OT and anesthesia procedures. • Assist in preoperative and intraoperative patient care. • Apply infection control and sterilization protocols in clinical settings.

Students will observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients. The students will be introduced to terminologies, equipment and techniques used for preparation and management of the OTAT. **(Total-180 hrs.)**

FIRST YEAR

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

SEMESTER-II

Code No.	Core Subjects
Discipline Specific Core Theory	
MOTAT 107 T	Anesthetic Equipments & Procedures
MOTAT 108 T	Advanced Anesthesia Techniques
MOTAT 109 T	Concept of Disease In Relation To Anesthesia & Critical Care
Discipline Specific Core Practical	
MOTAT 110 P	Anesthetic Equipments & Procedures
MOTAT 111 P	Concept of Disease In Relation To Anesthesia & Critical Care
MOTAT 112 CP	MOTAT Directed Clinical Education - II
Skill Enhancement Course	
SEC 001 T	Innovation and Entrepreneurship
SEC 002 T	One Health (NPTEL)

Name of the Program	M.Sc. Operation Theatre & Anesthesia Technology
Semester	Semester II
Name of the Course	Anesthetic Equipment's & Procedures
Course Code	MOTAT 107 T

Learning Outcome	• Familiarize students with anesthesia machines and patient monitoring tools. • Teach safe administration of anesthetic drugs and gases. • Provide hands-on training in airway management techniques.
Course Outcomes	• Explain the principles and functioning of anaesthetic equipment. • Demonstrate proper handling and maintenance of anaesthetic devices. • Apply anaesthesia techniques based on clinical requirements.

Sr. No.	Topics	No. of Hrs.
1	Medical Gases and Distribution System ▪ Medical gas supply, storage and safety The modern integrated Anesthesia workstation ▪ Anaesthesia machine & its components ▪ Fail safe system ▪ Safety check of anaesthesia machine Scavenger system	**10**
2	Monitoring Equipment ▪ Respiratory gas monitoring and minimum alveolar concentration ▪ Equipment's to measure depth of anesthesia • Bispectral index • Entropy ▪ Neuromuscular block monitoring equipment's ▪ Cardiac output monitors ▪ Equipment for central neuraxial and regional blocks ▪ Needles ▪ Catheters ▪ Nerve locators ▪ Ultrasound device ▪ Anesthesia equipment for magnetic resonance imaging ▪ How to Interpret X-rays, CT Scan, and MRI in clinical anaesthesia practice	**15**
3	Airway equipments and their accessories • Surgical airway equipments • Percutaneous airway equipments • Optical laryngoscopes • Airway introducers • Alternative to intubation	**10**

	Equipments for difficult airway	
4	Hemodynamic monitoring ▪ Pressure transducers: resonance ▪ Damping ▪ Invasive & non-invasive blood pressure measurement ▪ Oscillometry Pre-use check of anaesthesia equipments Sterilization and maintenance of anaesthesia equipments	**10**
TOTAL		**45 hrs**

MOTAT 110 P: ANAESTHETIC EQUIPMENTS & PROCEDURES

Sr. No.	Topics	No. of Hrs.
1	The modern integrated Anaesthesia workstation ▪ Anaesthesia machine & its components ▪ Fail safe system ▪ Safety check of anaesthesia machine ▪ Scavenger system	**30**
2	Equipment for central neuraxial and regional blocks ▪ Needles ▪ Catheters ▪ Nerve locators ▪ Ultrasound device	
3	Airway equipments and their accessories ▪ Surgical airway equipments ▪ Percutaneous airway equipments ▪ Optical laryngoscopes ▪ Airway introducers ▪ Alternative to intubation	
4	.Hemodynamic monitoring ▪ Pressure transducers: resonance ▪ Damping ▪ Invasive & non-invasive blood pressure measurement ▪ Oscillometry	
Total		**30 hrs**

Reference:

- A practical approach to anesthesia equipment- Jerry A Dorsch & Susan E Dorsch
- Anaesthesia equipment simplified- Gregory Rose & J Thomas Mclarney
- Understanding anaesthetic equipments and procedures A practical approach Dwarakadas K Baheti & Vandana V Laher

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester II**
Name of the Course	**ADVANCED ANAESTHESIA TECHNIQUES**
Course Code	**MOTAT 108 T**

Learning Outcome	• Train students in advanced regional and general anesthesia techniques. • Develop competency in handling anesthetic complications and emergencies. • Ensure an understanding of pharmacological principles in anesthesia.
Course Outcomes	• Understand advanced anaesthesia techniques for different surgical procedures. • Analyze patient responses and modify anaesthetic plans accordingly. • Demonstrate proficiency in administering specialized anaesthesia methods.

Sr. No.	Topics	No. of Hrs.
1	Vascular cannulation Central neuraxial blockade ▪ Potential benefits of central neuraxial block ▪ Mechanism of action, spread, uptake &elimination ▪ Ultrasound for central neuraxial blockade Peripheral nerve blocks Post anaesthesia care Ultrasound in ICU ▪ FAST ▪ Volume assessment ▪ Thoracic ultrasound	**10**
2	Review of modern technology in anaesthesia ▪ Ultrasound ▪ Fiberoptics ▪ X-ray	**7**
3	General anaesthesia ▪ Types and techniques ▪ Awareness during anaesthesia ▪ Complications ▪ The long term effects of general anaesthesia ▪ Management of general anaesthesia ▪ Anesthesia and children	**8**
4	Emergency anaesthesia guidelines ▪ Incidence and risk factor Anaesthetic emergencies ▪ Airway emergencies ▪ Anaphylaxis	**20**

	▪ Local anaesthetic toxicity ▪ Malignant hyperthermia The principles and conduct of anaesthesia for emergency surgery ▪ Choice of anaesthetic technique ▪ Management and protection of the airway including pulmonary aspiration ▪ The rapid sequence induction: evolution over time ▪ Management of ventilation ▪ Maintenance of anaesthesia	
Total		**45 hrs**

Reference:

- Anaesthesiology updates for postgraduates- Sampa Dutta Gupta
- Text book of anaesthesia for post graduates- T.K. Agasthi
- Step by step practical aspects of emergency anaesthesia- Arun Kumar Paul

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester II**
Name of the Course	**Concept of Disease In Relation To Anesthesia & Critical Care**
Course Code	**MOTAT 109 T**

Learning Outcome	• Explain disease mechanisms affecting anesthesia and critical care management. • Provide training in patient monitoring and life support techniques. • Develop analytical skills for clinical decision-making in critical care scenarios.
Course Outcomes	• Explain the pathophysiology of critical illnesses and their impact on patient management. • Analyze clinical conditions requiring critical care interventions. • Demonstrate decision-making skills in managing critically ill patients.

Sr. No.	Topics	No. of Hrs.
1	Mechanical Ventilation	**5**
2	Respiratory diseases- Asthma, pneumonia, COPD, Restrictive Lungs Disease, respiratory failure.	**5**
3	Kidney and urinary tract diseases- acute kidney injury, chronic kidney disease, UTI, Dialysis, glomerulonephritis	**5**
4	Liver and biliary disorders- Viral hepatitis, Alcoholic liver disease, liver failure, Hepatic coma, jaundice, cholecystitis	**5**
5	Endocrine and Metabolic disorders- diabetes mellitus, thyroid, adrenal, parathyroid disorders. Acid base and electrolytes imbalance	**5**
6	Neurological Disorders- diagnosis and management of unconscious , coma, head injuries, CVA, critical care and monitoring of patient with neurological illnesses Sepsis and Multi-organ failures –causes, diagnosis and management	**7**
7	ACID - BASE DISORDERS AND FLUID BALANCE- ABG analysis, Normal ABG value, Crystalloid and colloids: Differences, indications, Monitoring drip rate, Fluid balance: Intake/output chart	**6**
8	BLOOD TRANSFUSION- Blood Grouping and cross matching, Whole blood, packed RBC, Blood components and indications, Technique of blood transfusion, Complications of Blood Transfusion, Anaphylactic reaction.	**7**
Total		**45 hrs**

Reference:

1. Short textbook of anaesthesia
2. Anaesthesia for operation theatre technician.

MOTAT 111 P: Concept of Disease In Relation To Anesthesia & Critical Care

Sr. No.	Topics	No. of Hrs.
1	Mechanical Ventilation	30
2	MONITORING AND DIAGNOSTIC PROCEDURES IN I.C.U. - Clinical Monitoring, ECG monitoring. NIBP Cuff sizes and application Multi parameter monitor – Normal values	
3	GENERAL CARE OF PATIENT IN I.C.U. - Care of unconscious patient Syringe pump / Infusion Pump uses, infusion rate. Physiotherapy - chest physiotherapy, Oxygen Therapy Sources of oxygen, Oxygen Delivery devices, Oxygen Toxicity, Monitoring Hypoxia	
4	ACID - BASE DISORDERS AND FLUID BALANCE- ABG analysis, Normal ABG value, Crystalloid and colloids: Differences, indications, Monitoring drip rate, Fluid balance: Intake/output chart	
Total		**30 hrs**

Reference:

- Lee's synopsis
- Short text book of anesthesia

MOTAT 112 CP: MOTAT Directed Clinical Education – II

Course Outcomes	• Manage anesthesia and surgical equipment effectively. • Assist in advanced anesthesia and OT procedures. • Evaluate and respond to critical situations in the operation theatre.

Students will observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients. The students will be introduced to terminologies, equipment and techniques used for preparation and management of the OT. **(Total-270 hrs.)**

SKILL ENHANCEMENT COURSES

Name of the Program	**M.Sc. Operation Theatre & Anesthesia Technology**
Semester	**Semester II**
Name of the Course	**Innovation and Entrepreneurship**
Course Code	**SEC 001 T**

Course Outcome	• Develop an entrepreneurial mindset in the healthcare sector. • Apply innovation strategies to improve medical practices and patient care. • Demonstrate business planning and problem-solving skills in healthcare startups.

Sr. No.	Topics	No. of Hrs.
1	Innovation and Innovation Eco-System, The Policy Framework, Startup Landscape and Innovation Hubs, - Digital India and Make in India, - Linking Innovation with Intellectual Property Rights, Raising Finance for Startups in India, Innovation in Indian Context, Writing a business plan	**15**
2	Creativity and Research, Converting Researches to Innovation: Innovation Types and Models, Product Development, IPR and its Commercialisation, Support System to Develop Culture of Research and Innovation, Commercialisation of research and innovation, Fund raising – Research and Innovation, Envisioning Innovation and Scenario Building	**15**
3	Introduction to Innovation in Entrepreneurship, Idea Generation and Validation, Design Thinking in Entrepreneurship, Business Model Innovation, Technology and Innovation, Funding Innovation, Entrepreneurial Mindset, Leadership & amp; Intellectual Property, Scaling and Growth Strategies, sustainability & amp; Social Innovation	**15**
Total		**45 hrs**

Name of the Program	M.Sc. Operation Theatre & Anesthesia Technology
Semester	Semester II
Name of the Course	One Health (NPTEL)
Course Code	SEC 002 T

Course Outcomes	• Understand the interconnectedness of human, animal, and environmental health in a global context. • Analyze the impact of zoonotic diseases and antimicrobial resistance on public health and ecosystems. • Evaluate policies and strategies for disease prevention and sustainable development within the One Health framework.

Sr. No.	Topics	No. of Hrs.
1	**Introduction to One Health :** • Introduction to the One Health One Medicine Concept and National & International health/public health agencies • Global Health vs One Health • Basics of Research Ethics • Integrated human and animal disease surveillance systems • Recent success of One Health in control of emerging infectious diseases and the application of One Health in the control of endemic zoonoses in resource-poor communities	**5**
2	**Emerging Infectious Diseases and Antimicrobia l Resistance:** • Emerging infectious diseases • Process of disease emergence and assessment of the risk factors • Mechanisms of pathogen cross over across species boundaries and emerging infectious disease transmission, and its relevance in the 21st century • Importance of disease detection, Identification and monitoring in public health and the gaps in current health systems approaches and importance of Genome Sequencing • Introduction to disease vectors and basics of Medical Entomology • The factors influencing an emerging disease (whether is controlled or becomes endemic/epidemic as illustrated by different emerging diseases -STDs, HIV/AIDS, avian influenza, SARS, Ebola) • Antimicrobial resistance a global threat and Importance of antibiotic stewardship program • Introduction of Food Safety and Food Borne Diseases	**10**
3	**One Health Application in Management of Zoonotic Diseases:** • What are zoonotic diseases & its role in our changing world • Understanding of bacterial, viral and parasitic zoonotic diseases; critical evaluation of its control measures, awareness of local, national and global factors and Influences • Biogeography of zoonosis	**10**

	• The integration of human, animal and ecosystem health in the control and prevention of these diseases • Community engagement for zoonotic disease control in humans and animals through One Health	
4	**Applied Epidemiology & Public Health in One Health Research:** • Basics of Epidemiological Studies • Rapid Response system, Disaster Management and Outbreak Investigation Plans • Basic statistical methods and their application and the measurement of disease frequency • Principles of survey design and the concepts of sampling • Mixed method research	**5**
5	**One Health and Health Policy:** • Introduction to health policy • Political and institutional challenges in implementing One Health and the importance of a unified policy to address the shared health threats of humans and animals	**5**
6	**Media & Community engagement for One Health**: • Risk Communication and Pandemic Preparedness • How ICMR and other Public Health Institutes tackled and managed pandemic situation in the country • Role of community in disease control & ways for community engagement • Uses of different types of media for communication and impact of the media on public attitudes to disease	**10**
Total		**45 hrs**

***Note:** Attaint the NPTEL Course with title and course code as "**One Health (Course Code: noc25-ge25) (NPTEL)".**

Scheme of University Examination Theory for PG Program:

General structure / patterns for setting up question papers for Theory / Practical courses, their evaluation weightages for PG programs of MGMSBS are given in the following tables

Marks scheme for the University exam:

Final theory marks will be 100 marks (80 marks University Theory exam + 20 Marks Internal assessment).

Question		Marks distribution	Marks allotted per section	Marks
Sec: A	MCQ	10 x 1 M = 10	10	10
Sec: B	SAQ	3/4x 5 M = 15	15	35
Sec: B	LAQ	2/3 x 10 M = 10	20	
Sec: C	SAQ	3/4x 5 M = 15	15	35
Sec: C	LAQ	2/3x 10 M = 10	20	
Total				**80 Marks**

Marks Scheme for the University Examination (50 Marks)

Final theory marks will be 50 marks University Theory exam pattern Research Methodology & Biostatistics (Core course)

Question	Question No.	Question Type	Marks Distribution	Marks
Sec: A	1.	LAQ (2 out of 3)	2 X 10 Marks = 20	20
Sec: B	2.	SAQ (6 out of 8)	6 X 05 Marks = 30	30
Total				**50 Marks**

Marks Scheme for the University Examination (100 Marks)

Final theory marks will be 100 marks University Theory exam pattern Elective Course

Question	Question No.	Question Type	Marks Distribution	Marks
Sec: A	1.	LAQ (10 out of 12)	10 X 10 Marks = 100	100
Total				**100 Marks**

Practical exam pattern: Total 40 marks with following breakup:

Exercise	Description	Marks
Q No 1	Practical exercise - 1	1 x15=15 M
Q No 2	Station exercise	2x5M=10 M
Q No 3	VIVA	10 M
Q No 4	Journal	5M
Total		**40 Marks**

Practical exam pattern Research Methodology & Biostatistics (Core course)

Total 50-mark distribution:

Exercise	Description	Marks
Q No 1	**Practical/Problem-Solving:** These questions can assess statistical analysis, research design, hypothesis testing, or interpretation of data etc	2 × 10 marks each) = **20 marks**
Q No 2	Identification of study designs, Critical appraisal of research papers, Application of biostatistical tools, Sampling techniques etc	(4 × 5 marks each) = **20 marks**
Q No 3	**Viva Voce (Oral Examination)** Assessing conceptual clarity, application of research methodology, and statistical reasoning.	**10 marks**
Total		**50 Marks**

Practical to be conducted at respective departments and marks submitted jointly by the parent department to the university.

Breakup of theory IA calculation for 20 marks

Description	Marks
Internal exam (at department)	15 marks
Seminar	5 marks
Total	**20 Marks**

Breakup of practical IA calculation:

Description	Marks
Internal exam (at department)	10 marks
Viva	5 marks
Journal	5 marks
Total	**20 Marks**

Note –20 marks to be converted to 10 marks weightage for submission to the university.

Model Checklist for Evaluation of the Clinical Directed Posting (PG)
Name of the student: _____Date:_____
Program:_____
Semester: _____ Name of the Internal faculty/Observer:_____
Name of the External Faculty/Observer:_____

Core Competencies	Marks allotted	Marks obtained
Students will begin to develop critical thinking abilities utilizing the allied health personnel roles of communicator and caregiver. Students will learn principles of professional allied health personnel practice and provide direct care to individuals within a medical surgical setting while recognizing the diverse uniqueness of individuals with health alterations.		
Clinical Teaching		
a. Demonstrate beginning competency in technical skills.	10	
Independent Work by Student guided by faculty		
a. Develop effective communication skills (verbally and through charting) with patients, team members, and family	2.5	
b. Identify intra and inter-professional team member roles and scopes of practice. Establish appropriate relationships with team members.	2.5	
Hands on practical work by students		
a. Protect confidentiality of electronic/manual health records data, information, and knowledge of technology in an ethical manner	05	
Independent work by student		
a. Demonstrate expected behaviors and complete tasks in a timely manner. Arrive to clinical experiences at assigned times. Maintain professional behavior and appearance.	05	
Log book	10	
Viva	10	
Attendance	05	
Total	**50 Marks**	

Sign of Internal Examiner: _____
Sign of External Examiner: _____

MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

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