MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A++' Accredited by NAAC
Sector-01, Kamothe, Navi Mumbai -410 209
Tel 022-27432471, 022-27432994, Fax 022 -27431094
E-mail: registrar@mgmuhs.com; Website :www.mgmuhs.com

CHOICE BASED CREDIT SYSTEM

(CBCS)

(with effect from 2024-25 Batches)

Curriculum for

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

Approved in AC-49/2024, Dated 25/04/2024

Amended History

1. Approved as per AC-49/2024 [Resolution No. 3.2], [Resolution No. 3.8]; [Resolution No. 3.10 (ii)] Dated 25/04/2024.

Annexure-3 of AC-49/2024

MGM SCHOOL OF BIOMEDICAL SCIENCES
(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
Sector 1, Kamothe Navi Mumbai-410209,
Tel.No.: 022-27437631, 27437632, 27432890
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CHOICE BASED CREDIT SYSTEM (CBCS)

(Academic Year 2024 - 25)

Curriculum for

M.Sc. Allied Health Sciences

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

First Year

Semester I & II

Resolution No. 3.2 of Academic Council (AC-49/2024):

Resolved to approve the syllabus of M.Sc. Operation Theatre and Anesthesia Technology (Semester I & II), to be effective from Academic Year 2024-25 onwards, with an intake of 02 students at both MGMIHS campuses (Navi Mumbai & Chhatrapati Sambhaji Nagar), with tuition fees of Rs. 1,05,000/- per annum [ANNEXURE-3].

DIRECTOR'S MESSAGE

Dear Students, Greetings!!!!!

I take this opportunity to welcome you on behalf of MGM family to the Masters Degree at MGM School of Biomedical Sciences.(MGMSBS)

MGM School of Biomedical Sciences (MGM SBS) established in the year 2007, the MGM School of Biomedical Sciences envisaged building a progressive learning community and is committed to pursuit of excellence in higher education, total development of personality and shaping the students into sensitive, self-reliant citizens of the country imbued with the ideals of secularism and a scientific aptitude. We setg lobal standards to make our students scientifically as well as ethically stronger. The college adopts the national qualification frame work for the post-graduate programs which has adopted Credit Base Choice System (CBCS) so that, we construct a value based system of education that encourages critical thinking and creativity, are search plat formas opposed to rote learning.

The P.G (M.Sc.) courses of fere dare; Biotechnology, Genetics, Molecular Biology, Masters in Hospital administration and Biostatistics, M.Sc. Cardiac Care Technology, M.Sc. Medical Radiology and Imaging Technology, M. Optometry, M.Sc. Medical Dialysis Technology. Over time, the program has evolved, to meet the challenges of the ever changing field of biomedical education system.

With Best Wishes,

Director

MGM School of Biomedical Sciences

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 21 courses each with its own distinct, specialized body of knowledge and skill. This includes 7 UG courses and 14 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 581at present.

Our consistent theme throughout is to encourage students to become engaged, be active learners and to promote medical research so that ultimately they acquire knowledge, skills, and understanding 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:

Graduate from any statutory university with B.Sc. Degree in Medical Technology with OT & Anesthesia as specialization from a recognized University.

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

Program Outcome:

- Have a lifelong knowledge of Anesthesia, Surgery & all the Equipments used in it along with basic knowledge of applied science.
- Anesthesia & Surgical Technicians/Assistants will work in Operation Theatres, ICUs etc. along with Anesthetists and Surgeons & thus will be having a great & Important role in Health care.
- After completion students can go for Academics as well by joining different Colleges and Universities as Lecturers/Tutors.
- This Program will build technical knowledge in the student so that he/she will be able to assist an Anesthetist/Surgeon in every aspect of Anesthesia, Surgery & other related fields.
- Engage in lifelong learning and adapt to changing professional and societal needs.
- This Program can do an overall development of the student to be able to have all the technical aspects about Anesthesia, Surgery along with their advanced knowledge.

Program Specific Outcome:

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

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 Assesment (IA)	Semester End Exam (SEE)	Total
Discipiline Specific Core Theory														
MOTAT 101 L	Applied Anatomy & Physiology	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 102 L	Pre-operative Assessment &Optimisation Strategies	3	-	-	-	**3**	45		-	-	**45**	**20**	**80**	**100**
MOTAT 103 L	Surgical Equipments & Technology	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 104 CP	MOTAT Directed Clinical Education-I	-	-	-	21	**7**	-	-	-	315	**315**	-	**50**	**50**
CC 001 L	Research Methodology & Biostatistics (Core Course)	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
Discipiline Specific Core Practical														
MOTAT 102 P	Pre-operative Assessment &Optimisation Strategies	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
MOTAT 103 P	Surgical Equipments & Technology	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	**2**	-	-	60	-	**60**	**10**	**40**	**50**
Total		**12**	**0**	**8**	**21**	**23**	**180**	**0**	**120**	**315**	**615**	**110**	**490**	**600**

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 Assesment (IA)	Semester End Exam (SEE)	Total
Discipiline Specific Core Theory														
MOTAT 105 L	Anaesthetic Equipments & Procedures	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 106 L	Advance Anesthesia Techniques	3	-	-	-	**3**	45		-	-	**45**	**20**	**80**	**100**
MOTAT 107 L	Concept of Disease In Relation To Anesthesia And Critical Care	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
MOTAT 108 CP	MOTAT Directed Clinical Education-II	-	-	-	24	**8**	-	-	-	360	**360**	-	**50**	**50**
Discipiline Specific Core Practical														
MOTAT 105 P	Anaesthetic Equipments & Procedures	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
MOTAT 107 P	Concept of Disease In Relation To Anesthesia And Critical Care	-	-	2	-	**1**	-	-	30	-	**30**	**10**	**40**	**50**
Skill Ehancement Course														
SEC 001 L	Innovation and Enterprenuarship	3	-	-	-	**3**	45	-	-	-	**45**	**20**	**80**	**100**
SEC 002 L	One Health (NPTEL)													
Total		**12**	**0**	**4**	**24**	**22**	**180**	**0**	**60**	**360**	**600**	**100**	**450**	**550**

FIRST YEAR

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

SEMESTER-I

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

Name of the Programme	M.Sc. Operation Theatre & Anesthesia Technology
Name of the Course	Applied Anatomy & Physiology
Course Code	MOTAT 101 L

Teaching Objective	To know about anatomy relevant to operation theatre.
Learning Outcomes	Study the detailed structure of Respiratory, Cardiovascular &Nervous system & physiology of all associated structures.

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, 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 Cranial Nerves	9
5	**Hepatic system** Anatomy of Liver, Lobes and Blood Supply Functions of Liver, Functional division of Liver Histology- Liver Lobules	6

	Pressure Flow Autoregulation	
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 Programme	M.Sc. Operation Theatre & Anesthesia Technology
Name of the Course	Pre-operative Assessment & Optimisation Strategies
Course Code	MOTAT 102 L

Teaching Objective	Capable of doing preoperative assessments and interpreting full spectrum of diagnostic tests and special procedures related to care of critically ill, under the supervision of a critical care specialist and evaluate the outcomes of intervention.
Learning Outcomes	Should be able to read and understand all laboratory reports. Basic knowledge on different investigations like blood chemistry, radiological tests etc.

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 electrolytes.	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
11		**45 hrs**

MOTAT 102 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.	**30**
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		**30 hrs**

Reference:

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

Name of the Programme	**M.Sc. Operation Theatre & Anesthesia Technology**
Name of the Course	**Surgical Equipments & Technology**
Course Code	**MOTAT 103 L**

Teaching Objective	In this course to study about the structure of the operation theater, how to prepare the surgical team, surgical instruments and surgical procedure. Moreover know about correct uses of different types of surgical instrument in surgery.
Learning Outcomes	Student should be able to se different types of surgical instruments. They should have a basic knowledge of surgical team, roles, various surgical procedures, surgical Equipments along with sterilization techniques

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 103 P: Surgical Equipments & 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**

MOTAT 104 CP: MOTAT Directed Clinical Education – I

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- 315 hrs.)**

Name of the Programme	M.Sc. Operation Theatre & Anesthesia Technology
Name of the Course	Research Methodology & Biostatistics (Core Course)
Course Code	CC 001 L

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, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	• Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis, interpretation & reporting of results and use of statistical software.

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, Panel 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), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement	3
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	4
6	Ethics and Ethical practice in research 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, one way scatter plots, Box plots, two way 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, Measuring the Power of a Hypothesis Test, Normal distribution, Important Parametric Tests including Z-test, t-test, and ANOVA	4
10	Chi-squareTest: Chi-square as a Non parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	3
12	Non parametric or Distribution free Tests: Important Non parametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test, Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
13	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	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 parametricor Distribution-free Tests	8
9	Computer Application Using Statistical Software including SPSS	6
Total		**60 hrs**

FIRST YEAR

M.Sc. OPERATION THEATRE & ANESTHESIA TECHNOLOGY

SEMESTER-II

Code No.	Core Subjects
Discipline Specific Core Theory	
MOTAT 105 L	Anaesthetic Equipments & Procedures
MOTAT 106 L	Advanced Anaesthesia Techniques
MOTAT 107 L	Concept of Disease In Relation To Anesthesia & Critical Care
MOTAT 108 CP	MOTAT Directed Clinical Education - II
Discipline Specific Core Practical	
MOTAT 105 P	Anaesthetic Equipments & Procedures
MOTAT 107 P	Concept of Disease In Relation To Anesthesia & Critical Care
Skill Enhancement Course	
SEC 001 L	Innovation and Entrepreneurship
SEC 002 L	One Health (NPTEL)

Name of the Programme	**M.Sc. Operation Theatre & Anesthesia Technology**
Name of the Course	**Anaesthetic Equipments & Procedures**
Course Code	**MOTAT 105 L**

Teaching Objective	• To know about introduction of basic anesthetic equipments & procedures.
Learning Outcomes	• Knowledge about modern integrated anaesthesia workstation • Describe and operate the anaesthetic monitoring devices. • Prepare for management of difficult airway under the leadership of anaesthesiologists. • Set up for the haemodynamic monitoring and troubleshoot its errors. • Practice the maintenance of anaesthetic gadgets.

Sr. No.	Topics	No. of Hrs.
1	□ Medical Gases and Distribution System ▪ Medical gas supply, storage and safety □ The modern integrated Anaesthesia 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 ▪ Equipments to measure depth of anaesthesia • Bispectral index • Entropy ▪ Neuromuscular block monitoring equipments ▪ 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	**10**

	• Airway introducers • Alternative to intubation 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 105 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 anaesthesia 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 Programme	M.Sc. Operation Theatre & Anesthesia Technology
Name of the Course	ADVANCED ANAESTHESIA TECHNIQUES
Course Code	MOTAT 106 L

Teaching Objective	• Common procedures performed in anesthesia, intensive care unit, and emergency department. • Physics and technology involved in the functioning of special equipment used to aid the procedures
Learning Outcomes	• Explain the different techniques of regional anaesthesia. • Describe the technique of general anaesthesia and management of its complications. • Discuss the anaesthetic emergencies and their management. • Understand the delivery of anaesthesia for emergency surgery.

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	20

	▪ Incidence and risk factor Anaesthetic emergencies ▪ Airway emergencies ▪ Anaphylaxis ▪ 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 Programme	**M.Sc. Operation Theatre & Anesthesia Technology**
Name of the Course	**Concept of Disease In Relation To Anesthesia & Critical Care**
Course Code	**MOTAT 107 L**

Teaching Objective	• Should be able integrate knowledge with practice in handling and maintaining various of anesthesia, monitoring and equipments.
Learning Outcomes	• Should be able to manage advanced patient care procedures during anesthesia and critical care.

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 107 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 108 CP: MOTAT Directed Clinical Education – II

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-360 hrs)**

SKILL ENHANCEMENT COURSES

Name of the Programme	**M.Sc. Operation Theatre & Anesthesia Technology**
Name of the Course	**Innovation and Entrepreneurship**
Course Code	**SEC 001 L**

Course Outcome	• Students will grasp the concepts of innovation, its ecosystem, and the role of various stakeholders such as government policies, startups, and innovation hubs. • Cultivating an entrepreneurial mindset and leadership qualities necessary for driving innovation and leading ventures. • Understanding the intersection of technology and innovation and leveraging emerging technologies for entrepreneurial ventures.

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 Programme	M.Sc. Operation Theatre & Anesthesia Technology
Name of the Course	One Health (NPTEL)
Course Code	SEC 002 L

Course Outcomes	• A comprehensive understanding of One Health's role in global health challenges, emphasizing interconnectedness among human, animal, and environmental health. • Topics include research ethics, disease surveillance, and successes in controlling emerging infectious diseases. • Students explore disease emergence, transmission, antimicrobial resistance, and food safety, gaining insights into effective public health strategies.

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 Antimicrobial 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**

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

2.2 a Marks scheme for the University exam:

Final theory marks will be 10**0 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 M

2.2 b Practical exam pattern: Total 40 marks with following breakup :

Exercise	Description	Marks
Q No 1	Practical exercise - 1	1 x20=20 M
Q No 2	Station exercise	2x5M=10 M
Q No 3	VIVA	10 M
QNo 4	Journal	NIL
		Total = 40 M

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

2.2 d Breakup of theory IA calculation for 20 marks

Internal exam (at department)	15 marks
Seminar	5 marks
	Total = 20 M

Breakup of practical IA calculation:

Internal exam (at department)	10 marks
Viva	5 marks
Journal	5 marks
	Total = 20 M

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	arks obtained
1. 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		
2. Demonstrate beginning competency in technical skills.	10	
3. **Independent Work by Student guided by faculty**		
4. Develop effective communication skills (verbally and through charting) with patients, team members, and family	2.5	
5. Identify intra and inter-professional team member roles and scopes of practice. Establish appropriate relationships with team members.	2.5	
6. **Hands on practical work by students**		
7. Protect confidentiality of electronic/manual health records data, information, and knowledge of technology in an ethical manner	05	
8. **Independent work by student**		
9. Demonstrate expected behaviors and complete tasks in a timely manner. Arrive to clinical experiences at assigned times. Maintain professional behavior and appearance.	05	
10. **Log book**	10	
11. Viva	10	
12. Attendance	05	
Total	**50 Marks**	

Sign of Internal Examiner:_____

Sign of External Examiner:_____

Resolution No. 3.8 of Academic Council (AC-49/2024):

Resolved to approve the proposal to initiate MOOC programs as an elective in M.Sc. Clinical Nutrition, M.Sc. OT&AT and M.Sc. Emergency & Trauma Care as a pilot study (for including in the marksheet) from batch admitted in Academic Year 2024-25 onwards.

Resolution No. 3.10 of Academic Council (AC-49/2024):

(ii) Resolved and approved to collect the Dissertations/Projects 60 days before the University examination for all 2-year M.Sc. programs under MGM School of Biomedical Sciences to fulfil the credit allotted for project work, to be effective from batch 2023-24 onwards.

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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