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. Emergency & Trauma Care 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-3.10)], [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-3.10 of AC-51/2025

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.:022-2743763, 27437632, 27432890
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CHOICE BASED CREDIT SYSTEM (CBCS)

(Academic Year 2025-26)

Curriculum for

M.Sc. Allied Health Sciences

M.Sc. Emergency and Trauma Care 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 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. Emergency & Trauma Care Technology

Duration of Study:

The duration of the study for M.Sc. Emergency & Trauma Care Technology will be of 2years.

Eligibility Criteria:

Candidate should have passed the Bachelor's Degree in Emergency Medicine, Respiratory Therapy, Physician Assistant, Anesthesiology Technology or its equivalent qualification from a recognized institution/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

Course Outcome:

- The course aims to provide students with the requisite clinical assessment, decision-making skills and management for arrange of Emergency conditions and including pharmacological and non-pharmacological the rapeutic interventions.

M.Sc. EMERGENCY & TRAUMA CARE TECHNOLOGY

Program Outcomes

Program Code	M.Sc. Emergency and Trauma Care Technology
PO1	**Advanced Knowledge and Skills in Emergency and Trauma Care:** In-depth understanding of emergency and trauma management in healthcare system. Proficiency in trauma diagnostics, patient assessment, and emergency protocols.
PO2	**Clinical Competency**: Develop clinical skills for managing trauma patients, including handling life-threatening situations such as cardiac arrest, severe injuries, or other medical emergencies. They will be trained to make critical decisions in high-pressure situations.
PO3	**Technological Proficience:** Strong understanding of advance technology used in emergency and trauma care, including diagnostic tools, monitoring systems, and life-support equipment. Efficiency in application of medical devices such as ventilators, defibrillators, and other advanced technology in trauma care.
PO4	**Leadership and Management:** Learn how to manage emergency healthcare teams, especially in high-stress environments like trauma units and emergency departments. Building leadership and communication skills essential for coordinating with healthcare professionals and patients during critical situations.
PO5	**Crisis Management and Decision-Making**: Acquire strong decision-making skills in crisis situations, understanding how to prioritize patient care and manage resources effectively.
PO6	**Effective Communication** – Communicate effectively with patients, families, and healthcare teams, ensuring clarity in emergency interventions, patient education, and crisis management.
PO7	**Interdisciplinary Healthcare Collaboration:** Ability to work in multidisciplinary teams, collaborating with physicians, nurses, paramedics, and other healthcare professionals to deliver comprehensive care.
PO8	**Research and Evidence-Based Practice:** Develop the ability to critically evaluate and integrate research findings into clinical practice, ensuring that trauma care and emergency interventions are based on the best available evidence. Contribute to the advancement of knowledge and best practices in emergency and trauma care through research and innovation.

Course Outcomes

Semester I

MET 101 T & MET 103 P	Trauma and Critical Care I (T+P)	Mapped PO	Teaching-Learning Methodology	Assessment Tools
CO1	Develop an in-depth understanding of trauma pathophysiology and the critical care needs of trauma patients.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO2	Demonstrate proficiency in trauma assessment, diagnostics, and intervention protocols in critical care settings.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO3	Analyse and apply trauma care techniques for life-threatening conditions, including respiratory failure, shock, and severe hemorrhage.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO4	Understand and manage multi-organ failure and support critical care systems in the trauma patient.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO5	Develop skills in managing trauma in the emergency department (ED) setting, including the integration of emergency medical services (EMS) and trauma teams.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill

				assessment, MCQ
MET 102 T & MET 104 P	**Trauma and Critical Care II (T+P)**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Demonstrate advanced clinical competencies in managing complex trauma cases, including severe head injuries, abdominal trauma, and spinal cord injuries.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO2	Apply evidence-based trauma care protocols for multi-organ failure and life-threatening conditions in the ICU.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO3	Integrate advanced monitoring techniques and critical care technologies in the management of trauma patients.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CC 001 T & CC 001 P	**Research Methodology & Biostatistics (T+ P)**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	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.	**PO3, PO4, PO8**	Lecture, Practical, Assignment, Seminar,	Internal assessment, University exam, Theory exam, Practical exam, Station exercise/OSCE/OSPE, Viva-voce, Assignment, MCQ
MET 105 CP	**MET Directed Clinical Education – I**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Build a robust theoretical	**PO1, PO2,**	Practical,	Internal assessment,

	foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.	**PO3, PO4, PO5, PO6, PO7**	Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment
CO2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students; confidence and competence in delivering quality patient care.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment
CO3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment

Semester II

MET 106 T & MET 108 P	Advance Critical Care and Management I	Mapped PO	Teaching-Learning Methodology	Assessment Tools
CO1	Master the management of critical conditions such as respiratory failure, cardiac arrest, and septic shock in trauma patients.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO2	Utilize advanced pharmacological agents and life-support systems to stabilize trauma patients in the ICU.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO3	Develop proficiency in managing complex trauma patients with multisystem involvement, including monitoring and decision-making in the ICU.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
MET 107 T	**Advance Critical Care and Management II**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Apply advanced techniques in the management of post-surgical trauma patients, including pain management, nutrition, and wound care.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO2	Develop proficiency in managing trauma-induced acute kidney injury, respiratory failure, and other complications in critical care.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Lecture, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Theory exam, Practical exam, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
CO3	Analyze and integrate new research findings	**PO1, PO2, PO3,**	Lecture, Demonstrations,	Internal assessment, University exam, Theory

	into clinical practice to improve outcomes in critical trauma care.	**PO4, PO5, PO6, PO7**	Assignments, Case-study, Seminar, Workshops, Clinical simulation	exam, Practical exam, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment, MCQ
MET 109 CP	**MET Directed Clinical Education – II**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment
CO2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students; confidence and competence in delivering quality patient care.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7**	Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment
CO3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	Practical, Demonstrations, Assignments, Case-study, Seminar, Workshops, Clinical simulation	Internal assessment, University exam, Practical exam, Station Exercise/OSCE/OSPE, Viva-voce, Log book, Seminar presentation, Assignments, Case study presentation Journal club, Skill assessment
SEC 001 T	**Innovation and Entrepreneurship**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Understand the principles of innovation in the healthcare sector, especially in trauma and emergency care technology.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	Theory, E-Learning, Guest lecture, Poster and videos	Internal assessment, University exam, Theory exam, Seminar, MCQ
CO2	Develop entrepreneurial skills to create solutions	**PO1, PO2, PO3,**	Theory, E-Learning, Guest lecture, Poster	Internal assessment, University exam, Theory

	that improve the delivery of emergency and trauma care in resource-limited settings.	**PO4, PO5, PO6, PO7, PO8**	and videos	exam, Seminar, MCQ
CO3	Analyze business models and strategies to launch healthcare-related startups focused on trauma care technology.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	Theory, E-Learning, Guest lecture, Poster and videos	Internal assessment, University exam, Theory exam, Seminar, MCQ
SEC 002 T	**One Health (NPTEL)**	**Mapped PO**	**Teaching-Learning Methodology**	**Assessment Tools**
CO1	Understand the One Health approach to integrating human, animal, and environmental health in the context of emergency and trauma care.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	E-learning, Assignment, Theory	Online NPTEL MCQ test
CO2	Analyse how environmental factors, zoonotic diseases, and global health issues impact trauma care systems.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	E-learning, Assignment, Theory	Online NPTEL MCQ test
CO3	Develop strategies to address the interconnections between human health, animal health, and ecosystem health to enhance trauma care management.	**PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8**	E-learning, Assignment, Theory	Online NPTEL MCQ test

OUTLINE OF COURSE CURRICULUM

M.Sc. Emergemcy and Trauma Care 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
Discipline Specific Core Theory														
MET 101 T	Trauma and Critical Care I	4	-	-	-	**4**	60	-	-	-	**60**	**20**	**80**	**100**
MET 102 T	Trauma and Critical Care II	3	-	-	-	**3**	45		-	-	**45**	**20**	**80**	**100**
CC 001 T	Research Methodology & Biostatics (Core Course)	3	-	-	-	**3**	45	-	-	-	**45**	-	**50**	**50**
Discipline Specific Core Practical														
MET 103 P	Trauma and Critical Care I	-	-	4	-	**2**	-	-	60	-	**60**	**10**	**40**	**50**
MET 104 P	Trauma and Critical Care II	-	-	4	-	**2**	-	-	60	-	**60**	**10**	**40**	**50**
MET 105 CP	MET Directed Clinical Education-I	-	-	-	12	**4**	-	-	-	180	**180**	-	**50**	**50**
CC 001 P	Research Methodology & Biostatics (Core Course)	-	-	4	-	**2**	-	-	60	-	**60**	-	**50**	**50**
Total		**10**	**0**	**12**	**12**	**20**	**150**	**0**	**180**	**180**	**510**	**60**	**390**	**450**

OUTLINE OF COURSE CURRICULUM

M.Sc. Emergemcy and Trauma Care 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
Discipline Specific Core Theory														
MET 106 T	Advance Critical Care and Management I	4	-	-	-	**4**	60	-	-	-	**60**	**20**	**80**	**100**
MET 107 T	Advance Critical Care and Management II	4	-	-	-	**4**	60	-	-	-	**60**	**20**	**80**	**100**
Discipline Specific Core Practical														
MET 108 P	Advance Critical Care and Management I	-	-	6	-	**3**	-	-	90	-	**90**	**10**	**40**	**50**
MET 109 CP	MET Directed Clinical Education-II	-	-	-	18	**6**	-	-	-	270	**270**	-	**50**	**50**
Skill Enhancement Course														
SEC 001 T	Innovation and Entrepreneurship	3	-	-	-	**3**	45	-	-	-	**45**	-	**100**	**100**
SEC 002 T	One Health (NPTEL)													
Total		**11**	**0**	**6**	**18**	**20**	**165**	**0**	**90**	**270**	**525**	**50**	**350**	**400**

FIRST YEAR

M.Sc. Emergency & Trauma Care Technology

SEMESTER-I

CODE NO.	CORE SUBJECT
Discipline Specific Core Theory	
MET 101 T	Trauma and Critical Care I
MET 102 T	Trauma and Critical Care II
CC 001 T	Research Methodology & Biostatistics (Core Course)
Discipline Specific Core Practical	
MET 103 P	Trauma and Critical Care I
MET 104 P	Trauma and Critical Care II
MET 105 CP	MET Directed Clinical Education I
CC 001 P	Research Methodology & Biostatistics (Core Course)

Name of the Program	**M.Sc. Emergency & Trauma Care Technology**
Semester	**Semester I**
Name of the Subject	**Trauma and Critical Care I**
Course Code	**MET 101 T**

Teaching Outcome	• Understand the advance trauma and critical care.
Course Outcomes	• Develop an in-depth understanding of trauma pathophysiology and the critical care needs of trauma patients. • Demonstrate proficiency in trauma assessment, diagnostics, and intervention protocols in critical care settings. • Analyze and apply trauma care techniques for life-threatening conditions, including respiratory failure, shock, and severe hemorrhage. • Understand and manage multi-organ failure and support critical care systems in the trauma patient. • Develop skills in managing trauma in the emergency department (ED) setting, including the integration of emergency medical services (EMS) and trauma teams.

Sr. No.	Topics	No. of Hrs.
1	Vitals –Blood Pressure, Pulse, Respiratory Rate, Temperature,	**6**
2	Systemic Physical Examinations	**6**
3	Hemodynamic-Arterial, Central Venous, PAC	**6**
4	Arterial Blood Gas Analysis in detail	**6**
5	ECG, Cardiac Rhythm and Arrhythmias	**6**
6	Oxygen delivery devices	**6**
7	Ventilation-Invasive and Non Invasive	**6**
8	Endotracheal Intubation-Anatomical landmark, Procedure, Indications, After care	**6**
9	Percutaneous Tracheostomy Anatomical landmark ,Procedure, Indications, After care	**6**
10	Chest Tube Insertion Anatomical landmark ,Procedure, Indications, After care	**6**
Total		**60 hrs**

MET 103 P: Trauma and Critical Care I

Sr. No.	Topics	No. of Hrs.
1	ECG Interpretation	**10**
2	Instruments Handling	**10**
3	Ventilator Settings	**10**
4	Airway and breathing skills (Intubation, LMA, Bag Mask Ventilation, Oral Airway, Needle Thoracocentesis, Upper Airway Obstruction, Chocking Management)	**10**
5	Skills related circulation (Peripheral Venous Access, Central Venous Access, Intraosseous Access)	**10**
6	Arrhythmias recognition and management (Defibrillation and Cardioversion)	**10**
Total		**60 hrs**

Name of the Program	M.Sc. Emergency & Trauma Care Technology
Semester	Semester I
Name of the Course	Trauma and Critical Care II
Course Code	MET 102 T

Teaching Outcome	• To understand the advance trauma and critical care.
Learning Outcomes	• Demonstrate advanced clinical competencies in managing complex trauma cases, including severe head injuries, abdominal trauma, and spinal cord injuries. • Apply evidence-based trauma care protocols for multi-organ failure and life-threatening conditions in the ICU. • Integrate advanced monitoring techniques and critical care technologies in the management of trauma patients.

Sr. No.	Topics	No. of Hrs.
1	Paracentesis-Diagnosis and therapeutic	**4**
2	Pericardiocentesis & Pacemaker Insertion	**4**
3	Bronchoscopy, Lumbar Puncture	**5**
4	Cardioversion and Defibrillation	**4**
5	Nutrition in the ICU-aspects of total Parenteral Nutrition(TPN), Ryles Tube insertion and feeding	**5**
6	Imaging in relation to Critical Care-X-ray, Ultrasound, ECHO, CT, MRI	**5**
7	Patients Safety in the ICU, Bed Utilisation and staffing models	**5**
8	Trauma in special population	**5**
9	Mechanism of Trauma, Triage in Trauma	**4**
10	Rehabilitation and Trauma	**4**
Total		**45 hrs**

MET 104 P: Trauma and Critical Care II

Sr. No.	Topics	No. of Hrs.
1	Pre Hospital Trauma Care	**20**
2	Hands on demonstration related to trauma and critical care	**20**
3	OSCEs(objective structured clinical examination)	**20**
Total		**60 hrs**

Name of the Program	**M.Sc. Emergency And Trauma Care Technology**
Semester	**Semester I**
Name of the Course	**Research Methodology & Biostatistics (Core Course)**
Course Code	**CC 001 T**

Teaching Outcome	• 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	• 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.	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.

Course Code- MET 105 CP: MET Directed Clinical Education – I

Course Outcomes	• Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies. • Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students; confidence and competence in delivering quality patient care. • Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.

Students will gain additional skills in interventional & advance procedure Students apply knowledge from previous clinical learning experience under the supervision of a senior technologist.
(Total- 180 hrs.)

FIRST YEAR

M. Sc. Emergency & Trauma Care Technology

SEMESTER-II

CODE NO	CORE SUBJECT
Discipline Specific Core Theory	
MET 106 T	Advance Critical Care and Management I
MET 107 T	Advance Critical Care and Management II
Discipline Specific Core Practical	
MET 108 P	Advance Critical Care and Management I
MET 109 CP	MET 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. Emergency & Trauma Care Technology**
Semester	**Semester II**
Name of the Course	**Advance Critical Care And Management I**
Course Code	**MET 106 T**

Teaching Outcome	• To understand the advance management in emergency.
Course Outcomes	• Master the management of critical conditions such as respiratory failure, cardiac arrest, and septic shock in trauma patients. • Utilize advanced pharmacological agents and life-support systems to stabilize trauma patients in the ICU. • Develop proficiency in managing complex trauma patients with multisystem involvement, including monitoring and decision-making in the ICU.

Sr. No.	Topics	No. of Hrs.
1	Cardiac Arrest Management, Post Cardiac Arrest Care	**5**
2	Management of Respiratory Disorders, Mechanical Ventilation, Nervous and chemical control of respiration including hypoxic drive and the role of CO2	**6**
3	Mechanism of Cardiovascular system, cardiac cycle, Normal Sinus rhythm, chemical and nervous control of the cardiovascular system, shock, arrhythmias, left ventricular failure, angina	**6**
4	Shock-Types & Management	**5**
5	Venous Thromboembolism	**5**
6	Management of Electrolytes disturbances, Acid Base disorders	**5**
7	Management of Endocrine and oncological Emergencies	**6**
8	Toxicology in ICU	**5**
9	DKA, Hyperos molar coma, Hypoglycemic syndrome	**5**
10	Management of Renal Disorders, Renal Replacement Therapy	**6**
11	Gastrointestinal and hepatic disorders, Esophageal foregion bodies, Nasogastric and feeding tube placement, Decontamination of the poisoned patient	**6**
Total		**60 hrs**

MET 108 P: Advance Critical Care and Management I

Sr. No.	Topics	No. of Hrs.
1	ICU Therapy	**30**
2	Hands on demonstration related critical care	**30**
3	OSCEs (objective structured clinical examination)	**30**
Total		**90 hrs**

Name of the Program	**M.Sc. Emergency & Trauma Care Technology**
Semester	**Semester II**
Name of the Course	**Advance Critical Care And Management II**
Course Code	**MET 107 T**

Teaching Outcome	• To understand the advance management in emergency.
Course Outcomes	• Apply advanced techniques in the management of post-surgical trauma patients, including pain management, nutrition, and wound care. • Develop proficiency in managing trauma-induced acute kidney injury, respiratory failure, and other complications in critical care. • Analyze and integrate new research findings into clinical practice to improve outcomes in critical trauma care.

Sr. No.	Topics	No. of Hrs.
1	Cerebral blood flow to include the circle of willis, Transient ischemic attack, sub arachnoids hemorrhage, Meningitis, Management of neurological disorders	**10**
2	Management of Hematological Disorders	**8**
3	Transfusion practices in ICU, Management of transfusion reactions	**6**
4	Transplant patients Care in ICU	**6**
5	Anatomical and physiological changes during pregnancy, assessment and examination of pregnant woman, Normal Labor, Abnormalities in pregnancy and labor, resuscitation in pregnancy	**10**
6	Anatomical and physiological differences between adults and children, pediatrics assessment and examination and recognition of the seriously ill or deteriorating child, management of the sick child and parents, management of cardiac arrest in neonates, infants and children	**10**
7	Psychological and psychiatric aspects of emergency medical management	**10**
Total		**60 hrs**

Course Code MET 109 CP: MET Directed Clinical Education – II

Course Outcomes	• Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies. • Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students; confidence and competence in delivering quality patient care. • Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.

Students will gain additional skills in interventional & advance procedure. Students apply knowledge from previous clinical learning experience under the supervision of a senior technologist.
(Total- 270 hrs.)

SKILL ENHANCEMENT COURSE

Name of the Program	**M.Sc. Emergency And Trauma Care Technology**
Semester	**Semester II**
Name of the Course	**Innovation and Entrepreneurship**
Course Code	**SEC 001 T**

Course Outcome	• Understand the principles of innovation in the healthcare sector, especially in trauma and emergency care technology. • Develop entrepreneurial skills to create solutions that improve the delivery of emergency and trauma care in resource-limited settings. • Analyze business models and strategies to launch healthcare-related startups focused on trauma care technology.

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 & Intellectual Property, Scaling and Growth Strategies, sustainability & Social Innovation	**15**
Total		**45 hrs**

Name of the Program	**M.Sc. Emergency And Trauma Care Technology**
Semester	**Semester II**
Name of the Course	**One Health (NPTEL)**
Course Code	**SEC 002 T**

Course Outcomes	• Understand the One Health approach to integrating human, animal, and environmental health in the context of emergency and trauma care. • Analyze how environmental factors, zoonotic diseases, and global health issues impact trauma care systems. • Develop strategies to address the interconnections between human health, animal health, and ecosystem health to enhance trauma care management.

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	**10**

	stewardship program • Introduction of Food Safety and Food Borne Diseases	
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 • 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	**10**
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-bt16) (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.

M.Sc. Emergency & Trauma Care Technology MGM Institute of Health Sciences

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:_____

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