Name of the Course	Joint M.Sc.-PhD in Molecular Medical Microbiology
Introduction	The molecular age has brought about dramatic changes in medical microbiology, and great leaps in our understanding of the mechanisms of infectious disease. Though the molecular aspect of microbiology has long been recognized, it has greatly expanded in recent years. The molecular study of medical microbiology reveals conceptual insights and technical approaches that have advanced the subject almost beyond recognition. This course aims to train microbiologists in molecular diagnosis of diseases, who can work in hospitals and contribute to the decision making process along with the core medical practitioners. Also they can contribute greatly as scientists in industries and academia. Additionally, the course aims to train medical doctors in molecular diagnosis of both communicable and non-communicable diseases.
Aim of the Course	To offer M.Sc. on Molecular Medical Microbiology jointly by Indian Institute of Technology Kharagpur (IITKGP) and Tata Medical Center (TMC), Kolkata.
Objectives	At the end of the Molecular Medical Microbiology course the student will be able to: • Work for problem solving in Molecular Medical Microbiology • Innovate in Molecular Medical Microbiology with regard to diagnostic tests/techniques and reagents. • May contribute to the analytical decision making process along with the core medical practitioners. • Participation in related academia and R&D industry.
Duration of program	• M.Sc.: 2 years • PhD: as per rule of IIT KGP (minimum 3 years; max: 8 years)
Skill set to be developed	a) In-depth knowledge in molecular methods to be used for diagnostic purposes in infectious and non-infectious diseases b) Technical expertise in modern molecular diagnostic approaches like next-gen sequencing etc. c) Ability to innovate novel diagnostic methods and reagents to be used by clinicians for more efficient disease diagnosis and consequent therapeutic approaches
Additional comments	Semester Exams will be conducted by the host Institute of the semester and the question papers will be set jointly as per necessity. Evaluation of the answer scripts will be done jointly. Responsibility for uploading grades in ERP will be done solely by Course/ Subject Coordinator from IIT Kharagpur. Comprehensive viva and project evaluation will be conducted jointly at the respective Institute.

M.Sc. Molecular Medical Microbiology Curriculum

Semester 1 **Location: IIT Kharagpur**		**Minimum Semester Credit Required: 27** **Cumulative Semester Credit : 27-28**		
Subject code	**Subject type**	**Subject name**	**L-T-P**	**Credit**
MM(New)	Depth	Vaccines and Immunity	**4-0-0**	**4**
MM(New)	Depth	Microbial Genetics and Genetic Engineering	**4-0-0**	**4**
MM(New)	Depth	Basics of Medical Microbiology	**4-0-0**	**4**
MM61511	Depth	Biostatistics	**3-1-0**	**4**
MM61313	Depth	Medical Biotechnology	**3-1-0**	**4**
MM(New)	Depth (Lab.)	Molecular Technology Laboratory	**0-0-6**	**4**
MM(New) **MM61501** **MM(New)** **BT60007**	Elective-I	Fundamentals of Biochemistry and Cell Biology Basic Human Anatomy, Physiology and Pathology Human Microbiome Computational Structural Biology	**3-0-0** **3-1-0** **4-0-0** **3-0-0**	**3** **4** **4** **3**

Semester 2 **Location: Tata Medical Center, Kolkata**		**Minimum Semester Credit Required: 24** **Cumulative Semester Credit : 51-52**		
Subject code	**Subject type**	**Subject name**	**L-T-P**	**Credit**
MM(New)	Depth	Clinical Research Methods	**4-0-0**	**4**
MM(New)	Depth	Clinical Microbiology	**4-0-0**	**4**
MM(New)	Depth	Hospital Skills Development	**4-0-0**	**4**
MM(New)	Depth	Antimicrobial Agents and Therapy	**4-0-0**	**4**
MM(New)	Depth	Global Health and Epidemiology	**3-1-0**	**4**
MM(New)	Depth (Lab.)	Clinical Microbiology Laboratory	**0-0-3**	**2**
MM(New)	Depth (Lab.)	Molecular Diagnostic Laboratory	**0-0-3**	**2**

Semester 3 **Location: IIT Kharagpur**		**Minimum Semester Credit Required: 18** **Cumulative Semester Credit : 69-72**		
Subject Code	**Subject type**	**Subject**	**L-T-P**	**Credit**
AG60091	**Elective II / III**	Modern genetics	3-1-0	4
MM60003		Proteomics and metabolomics in health and disease	3-0-0	3
BT60015		Secondary metabolism in plants and microbes	3-0-0	3
CY60005		Drug design and development	3-0-0	3
CY71003		Chemistry of natural products	3-1-0	4
MM61215		Animal transgenic technologies	3-1-0	4
MM60017		Evidence based medicine	3-0-0	3
MM61207		Fundamentals of biomaterials and living matter	3-1-0	4
CS63061		Telemedicine	3-0-0	3
CS60071		Algorithms for bioinformatics	3-0-0	3
MM(New)	**Seminar**		**0-0-0**	**2**
MM(New)	**Project 1**		**0-0-15**	**10**

Semester 4 **Location: Tata Medical Center, Kolkata**		**Minimum Semester Credit Required:22** **Cumulative Semester Credit : 91-94**		
	Subject Type		**L-T-P**	**Credit**
MM (New) **MM(New)** **MM(New)** **MM(New)** **MM(New)**	**Elective IV**	Oncogenic Viruses and other Microbes Associated with Cancer Infection Control And Infection Management In Stem Cell and Organ Transplantation Laboratory Organization and Management Applications of Mass Spectrometry Molecular Typing In Medical Microbiology	**4-0-0**	**4**
MM(New) **MM(New)** **MM(New)**	**Lab Elective V**	DNA and RNA Extraction from Clinical Samples and Microbes Probing for Microbial Targets Genotyping of Microbial Pathogens	**0-0-6**	**4**
	Project II		**0-0-15**	**10**
	Comprehensive Viva Voce		**0-0-0**	**4**