



FACULTY OF
SCIENCE AND
HEALTH SCIENCE



M.Sc. Microbiology

Programme Structure

 mitwpu.edu.in

Division	Faculty of Science and Health Science
School Name	School of Science & Environmental Studies
Department Name	Department of Biosciences and Technology
Programme Name	M.Sc. Microbiology

+ + + + + + + + + + + + + + **COURSE BASKET** + + + + + + + + + + + + + + +

| Course Type | Description |
|---------------------------|---|
| Programme Core (PC) | Courses dealing with the foundations, depth and breadth of the major in which the student is admitted at MIT-WPU |
| Programme Electives (PE) | Open electives under the Programme allow students to specialise in a particular area connected to their major. |
| Programme Major (PM) | This encompasses the specialised, in-depth coursework within a specific major. It focuses on the core concepts and skills relevant to that particular field of study. |
| Programme Foundation (PF) | These courses provide the essential background knowledge and skills needed to succeed in the chosen Programme. |
| University Core (UC) | Courses that reflect the core MIT-WPU values and the mission of Life Transformation of students. |
| University Electives (UE) | Multidisciplinary courses across the faculties at MIT-WPU and outside the Programme core. |

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| Course Basket | % Credit Allotment | Credits Assigned | |
|--------------------------------|--------------------|------------------|---------------|
| University Core (UC) | 6 | 5 | |
| Research Methodology (PC) | 5 | 4 | |
| Programme Core (PC) | 42 | 37 | |
| Programme Laboratory (PC) | 7 | 6 | |
| Programme Electives (PE) | 18 | 16 | |
| Project / Internship (PC) | 18 | 16 | |
| On-the-Job Training – OJT (PC) | 5 | 4 | |
| Total | 100 | 88 | |
| Semester | Odd(I) | Even(II) | Total Credits |
| First Year | 23 | 22 | 45 |
| Second Year | 22 | 21 | 43 |

SEMESTER – I

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|--|---------------|
| I | PC | Advanced Microbiology | 2 |
| I | PC | Microbial Physiology and Metabolism | 2 |
| I | PC | Biostatistics | 3 |
| I | PC | Evolution and Ecology | 2 |
| I | PC | Microbial Technology Lab – 01 | 3 |
| I | PC | Research Methodology | 4 |
| I | PE | Programme Elective – 01 | 4 |
| I | UC | Scientific Studies of Mind, Matter, Spirit and Consciousness | 2 |
| I | UC | Yoga | 1 |
| | | Total Credits: | 23 |

PROGRAMME ELECTIVE – 01

| Track | Course Name / Course Title | Total Credits |
|-------|--------------------------------------|---------------|
| 1 | Programming Languages for Biologists | 4 |
| 2 | Enzyme Technology | 4 |
| 3 | Immunology and Immunotechnology | 4 |

SEMESTER – II

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|-------------------------------|---------------|
| II | PC | Molecular Biology | 2 |
| II | PC | Immunology | 2 |
| II | PC | Medical Microbiology | 3 |
| II | PC | Environmental Microbiology | 2 |
| II | PC | Microbial Technology Lab – 02 | 3 |
| II | PC | Bioinformatics | 4 |
| II | PE | Programme Elective – 02 | 4 |
| II | UC | Foundations of Peace | 2 |
| | | Total Credits: | 22 |

PROGRAMME ELECTIVE – 02

| S.No. | Course Name / Course Title | Total Credits |
|-------|--|---------------|
| 1 | Design and Analysis of Algorithms in Biology | 4 |
| 2 | Advanced Bioprocess Technology | 4 |
| 3 | Microbial Pathogenesis | 4 |

SEMESTER – III

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|---|---------------|
| III | PC | Industrial and Food Microbiology | 3 |
| III | PC | Nanobiotechnology and Biomimetics | 2 |
| III | PC | Synthetic Biology and Metabolic Engineering | 3 |
| III | PE | Programme Elective – 03 | 4 |
| III | PC | On-the-Job Training (OJT) / Internship | 4 |
| III | PC | Project | 6 |
| | | Total Credits: | 22 |

PROGRAMME ELECTIVE – 03

| S.No. | Course Name / Course Title | Total Credits |
|-------|---|---------------|
| 1 | Genomics and Proteomics | 4 |
| 2 | Downstream Processing | 4 |
| 3 | Molecular Diagnostics and Clinical Research | 4 |

SEMESTER – IV

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|---|---------------|
| IV | PC | Bio-entrepreneurship, IPR and Bioethics | 2 |
| IV | PC | Microbial Biotechnology | 3 |
| IV | PC | Scientific Communication | 2 |
| IV | PE | Program Elective – 04 | 4 |
| IV | PC | Project / Industrial Internship | 10 |
| | | Total Credits: | 21 |

PROGRAMME ELECTIVE – 04

| S.No. | Course Name / Course Title | Total Credits |
|-------|----------------------------------|---------------|
| 1 | Computational Structural Biology | 4 |
| 2 | Microbes for Energy and Fuels | 4 |
| 3 | Infectious Diseases and Therapy | 4 |

PROFESSIONAL ELECTIVE TRACKS

TRACK I – BIOINFORMATICS

| S.No. | Course Name / Course Title |
|-------|--|
| 1 | Programming Languages for Biologists |
| 2 | Design and Analysis of Algorithms in Biology |
| 3 | Genomics and Proteomics |
| 4 | Computational Structural Biology |

TRACK II – BIOPROCESS ENGINEERING

| S.No. | Course Name / Course Title |
|-------|--------------------------------|
| 1 | Enzyme Technology |
| 2 | Advanced Bioprocess Technology |
| 3 | Downstream Processing |
| 4 | Microbes for Energy and Fuels |

TRACK III – MEDICAL MICROBIOLOGY

| S.No. | Course Name / Course Title |
|-------|---|
| 1 | Immunology and Immunotechnology |
| 2 | Microbial Pathogenesis |
| 3 | Molecular Diagnostics and Clinical Research |
| 4 | Infectious Diseases and Therapy |

*Modifications to the programmes and courses are contingent upon adherence to university guidelines and procedures. Any proposed changes must undergo a thorough review process, including consultation with relevant academic departments, approval from the appropriate administrative bodies, and compliance with accreditation standards. Additionally, consideration will be given to feedback from students, faculty, and other stakeholders to ensure that modifications align with the overall educational objectives and mission of the university. The implementation of any approved changes will be communicated transparently to the university community, and appropriate measures will be taken to facilitate a smooth transition for all affected parties.