



FACULTY OF  
SCIENCE AND  
HEALTH SCIENCE



***M.Sc. Chemistry***  
***Organic Chemistry***

Division	Faculty of Science and Health Science
School Name	School of Science & Environmental Studies
Department Name	Department of Chemistry
Programme Name	M.Sc. Chemistry Organic Chemistry

+ + + + + + + + + + + + + + **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.   |

### CREDIT DISTRIBUTION

| Course Basket                                | % Credit Allotment | Credits Assigned |
|--|--------------------|------------------|
| University Core (UC)                         | 06                 | 5                |
| Research Methodology (RM)                    | 04                 | 4                |
| Programme Foundation (PF)                    | 09                 | 8                |
| Programme Major (Theory and Laboratory) (PM) | 38                 | 33               |
| Programme Electives (PE)                     | 18                 | 16               |
| Project / Internship (PR)                    | 20                 | 18               |
| On-Job Training - OJT (PR)                   | 04                 | 04               |
| <b>Total</b>                                 | <b>100</b>         | <b>88</b>        |

| Semester    | Odd(I) | Even(II) | Total Credits |
|-------------|--------|----------|---------------|
| First Year  | 23     | 21       | 44            |
| Second Year | 24     | 20       | 44            |

## SEMESTER – I

| Semester | Course Type | Course Name / Course Title                                   | Total Credits |
|----------|-------------|--|---------------|
| I        | PF          | Synthetic Organic Chemistry                                  | 2             |
| I        | PF          | Thermodynamics and Kinetics                                  | 3             |
| I        | PF          | Advanced Coordination Chemistry                              | 3             |
| I        | RM          | Research Methodology   | 4             |
| I        | PM          | Organic Chemistry Lab – I                                    | 2             |
| I        | PM          | Physical & Inorganic Chemistry Lab                           | 2             |
| I        | PE          | Programme Elective – 01                                      | 4             |
| I        | UC          | Scientific Studies of Mind, Matter, Spirit and Consciousness | 2             |
| I        | UC          | Yoga   | 1             |
|          |             | <b>Total Credits:</b>  | <b>23</b>     |

## ELECTIVE BASKET - 01

| Track   | Elective Basket              | Name of the Course              |
|---------|------------------------------|---------------------------------|
| Track 1 | Advanced Organic Synthesis   | Techniques in Organic Synthesis |
| Track 2 | Pharmaceutical Chemistry     | Medicinal Chemistry             |
| Track 3 | Industrial Organic Chemistry | Bulk and Fine Organic Chemicals |

## SEMESTER – II

| Semester | Course Type | Course Name / Course Title                  | Total Credits |
|----------|-------------|---|---------------|
| II       | PM          | Instrumental Methods of Analysis            | 3             |
| II       | PM          | Heterocyclic Chemistry                      | 2             |
| II       | PM          | Organic Spectroscopy                        | 2             |
| II       | PM          | Organometallic and Supramolecular Chemistry | 3             |
| II       | PM          | Unit Processes in Organic Synthesis         | 3             |
| II       | PM          | Organic Chemistry Lab – II                  | 2             |
| II       | PE          | Programme Elective – 02                     | 4             |
| II       | UC          | Peace Building: Global Initiatives          | 2             |
|          |             | <b>Total Credits:</b>                       | <b>21</b>     |

## ELECTIVE BASKET - 02

| Track   | Elective Basket              | Name of the Course             |
|---------|------------------------------|--------------------------------|
| Track 1 | Advanced Organic Synthesis   | Reagents for Organic Synthesis |
| Track 2 | Pharmaceutical Chemistry     | Chemistry of Natural Products  |
| Track 3 | Industrial Organic Chemistry | Polymers and Plastics          |

## SEMESTER – III

| Semester | Course Type | Course Name / Course Title  | Total Credits |
|----------|-------------|---|---------------|
| III      | PM          | Organic Reaction Mechanisms and Stereochemistry                   | 3             |
| III      | PM          | Retrosynthesis: The Disconnection Approach                        | 2             |
| III      | PM          | Pericyclic Reactions, Photochemistry and Molecular Rearrangements | 3             |
| III      | PM          | Process Chemistry   | 2             |
| III      | PM          | Organic Chemistry Lab – III                                       | 2             |
| III      | PE          | Programme Elective – 03   | 4             |
| III      | PR          | On-Job Training (OJT) / Internship                                | 4             |
| III      | PR          | Research Project  | 4             |
|          |             | <b>Total Credits:</b>   | <b>24</b>     |

## ELECTIVE BASKET - 03

| Track   | Elective Basket              | Name of the Course                  |
|---------|------------------------------|-------------------------------------|
| Track 1 | Advanced Organic Synthesis   | Asymmetric Synthesis                |
| Track 2 | Pharmaceutical Chemistry     | Molecular Modelling for Drug Design |
| Track 3 | Industrial Organic Chemistry | Industrial Catalysis                |

## SEMESTER – IV

| Semester | Course Type | Course Name / Course Title                      | Total Credits |
|----------|-------------|---|---------------|
| IV       | PM          | Policies & Regulations in the Chemical Industry | 2             |
| IV       | PE          | Programme Elective – 04                         | 4             |
| IV       | PR          | Research Project / Internship                   | 14            |
|          |             | <b>Total Credits:</b>                           | <b>20</b>     |

## ELECTIVE BASKET – 04

| Track   | Elective Basket              | Name of the Course       |
|---------|------------------------------|--------------------------|
| Track 1 | Advanced Organic Synthesis   | Green Chemical Synthesis |
| Track 2 | Pharmaceutical Chemistry     | Pharmaceutical Analysis  |
| Track 3 | Industrial Organic Chemistry | Technology Transfer      |

## SEMESTER – VII

| Semester | Course Type | Course Name / Course Title                             | Total Credits |
|----------|-------------|--|---------------|
| VII      | PE          | Programme Elective – III                               | 4             |
| VII      | PM          | Principles of Regeneration and Developmental Biology   | 3             |
| VII      | PM          | ECM, Cell Signalling and Communications                | 3             |
| VII      | PM          | Systems Biology  | 3             |
| VII      | PM          | Tissue Engineering and Translational Medicine          | 3             |
| VII      | PC          | Tissue Engineering and Stem Cell Technology Laboratory | 3             |
|          |             | <b>Total Credits:</b>                                  | <b>19</b>     |

## PROGRAMME ELECTIVES – III

| S.No. | Course Name / Course Title                     | Total Credits |
|-------|--|---------------|
| 1     | Metabolomics in Health and Disease             | 4             |
| 2     | Biosensors and Bioimaging                      | 4             |
| 3     | Pharmaceutical Toxicology                      | 4             |
| 4     | Systematic Review and Meta-analysis            | 4             |
| 5     | MATLAB for Bioinformatics                      | 4             |
| 6     | Linux in Bioinformatics                        | 4             |
| 7     | Omics Technologies for Agri-Food Technology    | 4             |
| 8     | Principles of Food Preservation and Technology | 4             |

## SEMESTER – VIII

| Semester | Course Type | Course Name / Course Title  | Total Credits |
|----------|-------------|---|---------------|
| VIII     | PE          | Programme Elective – IV   | 4             |
| VIII     | PM          | Stem Cells and Translational Medicine                             | 3             |
| VIII     | PM          | Translation of Nanobiotechnology in Medicine                      | 3             |
| VIII     | PM          | Biomaterials and Mechanobiology                                   | 3             |
| VIII     | PM          | Regulatory Affairs in Tissue Engineering and Stem Cell Technology | 2             |
| VIII     | PC          | Tissue Engineering and Stem Cell Technology Laboratory – II       | 3             |
|          |             | <b>Total Credits:</b>   | <b>18</b>     |

## PROGRAMME ELECTIVES – IV

| S.No. | Course Name / Course Title                                   | Total Credits |
|-------|--|---------------|
| 1     | Experimental and Transgenic Animal Models                    | 4             |
| 2     | Drug Delivery Systems  | 4             |
| 3     | Clinical Data Science  | 4             |
| 4     | Medical Writing and Coding                                   | 4             |
| 5     | Introduction to Artificial Intelligence and Machine Learning | 4             |
| 6     | Biological Database Architecture                             | 4             |
| 7     | Precision Agriculture and Informatics                        | 4             |
| 8     | Agri-Food Management and Economics                           | 4             |

## SEMESTER – IX

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|----------------------------|---------------|
| IX       | PC          | On-the-Job Training (OJT)  |               |
| IX       | PC          | Research Project           |               |
|          |             | <b>Total Credits:</b>      | <b>22</b>     |

## SEMESTER – X

| Semester | Course Type | Course Name / Course Title        | Total Credits |
|----------|-------------|-----------------------------------|---------------|
| X        | PM          | Nanobiotechnology and Biomimetics |               |
| X        | PC          | Research Project                  |               |
|          |             | <b>Total Credits:</b>             | <b>15</b>     |

\*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.