

# Common Syllabus — M.Sc. Chemistry (4 Semesters)

## Program Structure (Typical)

Duration: 2 years (4 semesters). Includes theory papers, practicals, seminars, and project work.

### Semester I

Inorganic Chemistry — Structure, Spectroscopy & Coordination Chemistry

Organic Chemistry — Reaction Mechanisms, Stereochemistry

Physical Chemistry — Quantum Chemistry & Thermodynamics

Analytical Chemistry — Separation Techniques & Instrumental Methods

Laboratory I — Qualitative analysis, volumetric analysis

### Semester II

Inorganic Chemistry — Organometallics, Bioinorganic Chemistry

Organic Chemistry — Heterocycles, Pericyclic Reactions

Physical Chemistry — Spectroscopy, Chemical Dynamics

Analytical Chemistry — Chromatography & Electroanalytical Methods

Laboratory II — Organic synthesis & characterization

### Semester III

Advanced Physical Chemistry — Solid State, Surface Chemistry

Advanced Inorganic Chemistry — Coordination Chemistry

Advanced Organic Chemistry — Natural Products & Spectroscopy

Electives — Polymer Chemistry, Environmental Chemistry, Computational Chemistry

Laboratory III — Instrumental analysis (NMR, IR, MS)

## **Semester IV**

Advanced Analytical Techniques — Hyphenated Methods

Instrumentation & Method Development

Electives — Medicinal Chemistry, Nanomaterials

Project & Dissertation

Laboratory IV — Project-focused experiments

## **Learning Outcomes**

Mastery of chemical principles

Ability to operate scientific instruments

Competence in research and reporting

## **Recommended Books**

J.D. Lee — Concise Inorganic Chemistry

Clayden et al. — Organic Chemistry

Atkins & de Paula — Physical Chemistry

Skoog & Holler — Instrumental Analysis