

Module code

SPC-1202

Type of module

Undergraduate: Chemistry – Major Core

Fundamental Concepts in Chemistry



Modular credits

4

Total student
engagement

56 hours

Prerequisite

None

Anti-requisite

None

Aims

To develop a foundational understanding of atomic structure, bonding, organic molecules and material properties. It also aims to build understanding of properties and behaviours of organic and inorganic compounds.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse atomic structure, periodic trends, bonding theories, and intermolecular forces.

MLO 2

Predict structures and properties of molecules and solids using molecular orbital theory and solid-state concepts.

MLO 3

Analyse the preparation and chemistry of different functional groups and apply this knowledge to simple transformations and illustrate some fundamental mechanisms of organic reactions.

MLO 4

Outline key spectroscopic techniques and understand their role in chemical analysis.

MLO 5

Interpret and deduce the structure of simple organic molecules using spectroscopic methods.

Module contents

Fundamentals of atomic structure and wave mechanics

Periodic table including properties and trends

Chemistry of alkali and alkaline earth metals

Chemical bonding, Lewis structures and VSEPR

Molecular orbital theory: diatomic molecules

Solid state chemistry: structures of ionic solids and lattice energy

Intermolecular forces: hydrogen bonding, metallic bonding, and VDW forces

Organic molecules: structures and bonding, hybridisation and properties

Overview of isomers: constitutional isomers and stereoisomers

Introduction to functional groups and different types of organic reactions

Alkanes, alkenes and alkynes, their synthesis and reaction mechanisms

Spectral interpretation of hydrocarbons using IR, NMR and MS spectrometry

Assessment

60% **40%**

Examination

Coursework

Examination
60%

Quizzes/Tests
30%

10%

■ Examination — 60% ■ Quizzes/Tests — 30% ■ Assignments — 10%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	40%
Quizzes/Tests	30%
Assignments	10%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1 PLO 1 (Fundamental Knowledge in Chemistry)

6 PLO 6 (Digital Literacy and Lifelong Learning Skills)

3 PLO 3 (Critical Thinking and Problem-Solving Skills)

Sustainability concept addressed

4 SDG 4 Quality Education

Digital skills/software used (not limited to)

- Word processing software (e.g. Microsoft Word)
- Organisational tools (e.g. Outlook calendar)
- Learning management system (e.g. Canvas)

Micro-credentialling option

No

Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes

No

Document details

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