

Module code

SPC-2204

Type of module

Undergraduate: Chemistry – Major Core

Organic Synthesis and Reactivity



Modular credits

4

 Total student
engagement

56 hours

Prerequisite

 SPC-1202
(Fundamental
Concepts in Chemistry)

Anti-requisite

None

Aims

To provide students with knowledge on the chemistry of carbonyl and heterocyclic compounds, redox reactions, protecting group strategies along with basic strategies in organic synthesis and retrosynthesis.

Module learning outcomes (MLO)

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

MLO 1

Analyse the structure, bonding, and key properties of carbonyl and heterocyclic compounds.

MLO 2

Illustrate methods for the synthesis and reactivity of carbonyl and heterocyclic compounds using appropriate chemical mechanisms.

MLO 3

Apply retrosynthetic analysis to design synthetic routes for target organic molecules.

MLO 4

Analyse and interpret spectral data to identify and characterise carbonyl compounds and simple heterocycles.

Module contents

Carbonyl chemistry: IUPAC nomenclature, properties, preparation and reactions

Heterocyclic chemistry: importance, ring synthesis of selected heterocycles and reactivity

Introduction to organic synthesis and retrosynthetic analysis

Introduction to cross-coupling chemistry

Redox reactions and protecting group strategy

Spectral interpretation of carbonyl compounds and simple heterocycles

Assessment

60%

Examination

40%

Coursework

Examination
60%

20%

20%

■ Examination — 60% ■ Quizzes/Tests — 20% ■ Assignments — 20%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	40%
Quizzes/Tests	20%
Assignments	20%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1

PLO 1 (Fundamental Knowledge in Chemistry)

3

PLO 3 (Critical Thinking and Problem-Solving Skills)

6

PLO 6 (Digital Literacy and Lifelong Learning 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)
- Chemical drawing software (e.g. ChemSketch or ChemDraw)
- 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

Office ODVCE Document date 27 June 2026 Status New Approval GBF (12/02/2026)