

Module code

SPC-3402

Type of module

Undergraduate: Chemistry – Elective

Quantum Chemistry



Modular credits

2

Total student
engagement

28 hours

Prerequisite

SPC-1203
(Fundamentals of
Physical and
Spectroscopic
Chemistry)

Anti-requisite

None

Aims

To provide students with a foundational understanding of theory of atoms, quantum mechanics, of spectroscopic interpretations.

Module learning outcomes (MLO)

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

MLO 1

Analyse line spectra and evaluate atomic conservation in quantum systems using Bohr's atomic theory and de Broglie's postulate.

MLO 2

Analyse particle-wave duality and its role in the behaviour of matter at the quantum level.

MLO 3

Apply the Schrödinger equation to interpret atomic spectra and deepen knowledge of atomic structure through Quantum Mechanics.

Module contents

Newton theory of light	The birth of quantum mechanics	The theory of atoms based on quantum mechanics
Understanding particle-wave duality of light, particles, and atoms	The Schrödinger equation	Electronic energy levels of atoms
Molecular orbitals	Vibrational and rotational energies of molecules	

Assessment

60%

Examination

40%

Coursework

Examination
60%

20%

20%

■ Examination — 60%

■ Assignment and weekly short quiz — 20%

■ Short answers question — 20%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	40%
Assignment and weekly short quiz	20%
Short answers question	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

9

SDG 9 Industry, Innovation and Infrastructure

Digital skills/software used (not limited to)

- Word processing software (e.g. Microsoft Word)
- Learning management system (e.g. Canvas)
- Spectral processing software

Micro-credentialling option

No

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

No

Document details

Office ODVCE

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