

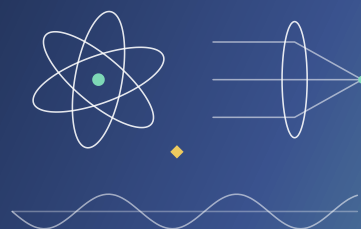
Module code

SPP-2206

Type of module

Undergraduate: Applied Physics – Major Core

Vibrations and Waves



Modular credits

4

Total student
engagement

56 hours

Prerequisite

None

Anti-requisite

None

Aims

To provide conceptual foundation in both the theoretical and practical aspects of vibrations and wave phenomena, enabling students to analyse and apply wave concepts across a wide range of scientific and engineering disciplines.

Module learning outcomes (MLO)

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

MLO 1

Apply fundamental principles of vibrations and waves, including harmonic motion and the wave equation.

MLO 2

Analyse the behaviour and interaction of mechanical and sound waves, including superposition, interference, and the Doppler effect.

MLO 3

Solve quantitative problems involving wave motion and oscillatory systems using theoretical and mathematical methods.

MLO 4

Evaluate and analyse wave phenomena and their applications in real-world physical systems.

Module contents

Introduction to vibrations and waves

Simple harmonic motion and oscillatory systems

Wave properties and types of waves

Sound waves and their characteristics

Superposition and interference of waves

Wave motion

Properties of mechanical waves

Doppler effect and its applications

Assessment

60%

Examination

40%

Coursework

Examination
60%

Class tests
40%

■ Examination — 60%

■ Class tests — 40%

Formative assessment

Weekly discussion
and lab experiments

Summative assessment

COMPONENT		WEIGHTING
Examination		60%
Coursework		40%
Individual		40%
Class tests		40%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1

PLO 1 (Core Disciplinary Knowledge)

2

PLO 2 (Critical Thinking and Comparative Analysis)

3

PLO 3 (Experimental and Instrumentation Skills)

4

PLO 4 (Numerical and Analytical Competence)

Sustainability concept addressed

4

SDG 4 Quality Education

Digital skills/software used (not limited to)

- Word processing software (e.g. Microsoft Word)
- Spreadsheet software (e.g. Microsoft Excel)
- Web Browsers (e.g. Internet Explorer)
- Learning Management Systems (e.g. Canvas)
- Communication Software (e.g. Microsoft Teams)

Micro-credentialling option

No

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

No

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