

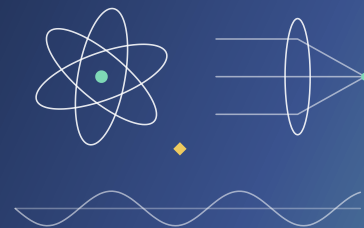
Module code

SPP-1202

Type of module

Undergraduate: Applied Physics – Major Core

Mathematical Physics



Modular credits

4

Total student
engagement

56 hours

Prerequisite

None

Anti-requisite

None

Aims

To equip first-year physics students with key mathematical methods and problem-solving skills, reinforcing core concepts while introducing advanced techniques for application in later physics modules.

Module learning outcomes (MLO)

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

MLO 1

Apply algebraic, calculus, and vector operations to solve mathematical problems relevant to physics.

MLO 2

Analyse functions, series, and limits to approximate and model physical systems.

MLO 3

Use partial differentiation, multiple integrals, and coordinate transformations to evaluate physical quantities such as mass distributions and centres of mass.

MLO 4

Solve first-order differential equations and interpret their solutions in the context of physical phenomena.

MLO 5

Integrate different mathematical techniques to model and critically evaluate solutions to physics-related problems.

Module contents

Foundations of algebra and calculus

Complex and hyperbolic functions

Series and approximations

Multivariable calculus and coordinate systems

Vector algebra and vector calculus

Differential equations and applications

Assessment

60%

Examination

40%

Coursework

Examination
60%

20%

10%

10%

Examination — 60%

Assignments — 20%

Tutorial problem sets — 10%

Group project — 10%

Formative assessment

Weekly discussion and feedback, problem-solving exercises, short group activities and peer-to-peer learning

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	30%
Assignments	20%
Tutorial problem sets	10%
Group	10%
Group project	10%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1

PLO 1 (Core Disciplinary Knowledge)

2

PLO 2 (Critical Thinking and Comparative Analysis)

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)
- Presentation Software (e.g. Microsoft PowerPoint)
- Data Analysis and processing tools (e.g. Microsoft Excel)

Micro-credentialling option

No

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

No

Document details

Office ODVCE

Document date 23 June 2026

Status New

Approval GBF (12/02/2026)