

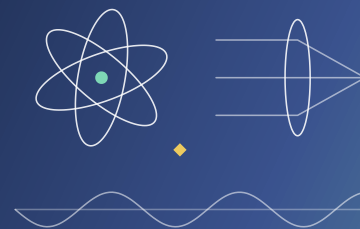
Module code

SPP-3401

Type of module

Undergraduate: Applied Physics – Elective

Electronics: Analogue and Digital



Modular credits

4

Total student
engagement

56 hours

Prerequisite

SPP-1203 Classical
Mechanics

Anti-requisite

None

Aims

To provide students with an understanding of electronics from introductory concepts to the design and implementation of electronic circuits.

Module learning outcomes (MLO)

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

MLO 1

Analyse the functions and roles of basic electronic components and devices in analogue and digital circuits.

MLO 2

Apply laboratory tools and electronic simulation software to test and analyse circuit behaviour.

MLO 3

Analyse the performance of analogue and digital electronic circuits using theoretical and experimental methods.

MLO 4

Design and construct analogue and digital circuits to meet specified functional requirements.

Module contents

Analogue Electronics	Ohm's law, resistors in series and parallel, and voltage dividers	Thévenin's and Norton's theorems
Capacitors, inductors, impedance, and reactance	Power in reactive circuits; AC circuits; series and parallel resonance	Passive filters (RC, RL, RLC)
Diodes and their applications	Operational amplifier configurations and applications	Oscillators
Basic bipolar and MOS transistor circuits	Digital Electronics	Number systems and binary codes

Bits, bytes, and words

Basic logic functions and Boolean algebra

Karnaugh maps and simplification of logic expressions

Flip-flops and their applications

Assessment

60%

Examination

40%

Coursework

Examination
60%

Class tests
40%

■ Examination — 60%

■ Class tests — 40%

Formative assessment

Weekly discussion,
feedback 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)

■ Electronics circuit simulation software (e.g. Circuit Maker)

■ 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

Document details

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