2024 / 25

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Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

Module Descriptor

Physics 1
(Computing and Mathematics)

Physics 1 (A09883)

Short Title: Physics 1
Department: Computing and Mathematics
Credits: 5 **Level:** Introductory

Description of Module / Aims

This module is designed to introduce the computing student to the mechanics, electricity, light and measurement principles that they are likely to encounter in their computing course. It assumes no prior knowledge of physics. There will be an emphasis on problem-solving and laboratory-based teaching throughout. Each element of the syllabus is supported by suitable experiments, which will develop the students experimental skills and understanding of measurement and associated uncertainties.

Programmes

		stage/semester/status
COMP-0542	BEng (Hons) in Electrical and Automation Engineering (International) (WD_ETRIC_BI)	1 / 1 / M
COMP-0542	BEng (Hons) in Information Engineering (International) (WD_EEELC_BI)	1 / 1 / M
COMP-0542	BSc (Hons) in Applied Computing (International) (WD_KACCM_BI)	1 / 1 / M
COMP-0542	BSc (Hons) in Applied Computing (WD_KACCM_B)	1 / 1 / M
COMP-0542	BSc (Hons) in Applied Computing (WD_KCOMP_B)	1 / 1 / M
COMP-0542	BSc (Hons) in Computer Forensics and Security (WD_KCOFO_B)	1 / 1 / M
COMP-0542	BSc (Hons) in Computer Science (WD_KCMSC_B)	1 / 1 / M
COMP-0542	BSc (Hons) in the Internet of Things (International) (WD_KINTT_BI)	1 / 1 / M

Indicative Content

- Mechanics: SI units; vectors; Newtons laws; gravitation; projectiles; energy; conservation laws; uniform circular motion
- Electricity: Ohm's law; simple resistor networks; Mains electricity and electrical safety
- Light: Electromagnetic spectrum; Reflection; Refraction; Diffraction; Interference
- Measurement: Introduction to the general principles of measurement

Learning Outcomes

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

1. Use the SI system of units to carry out formula-based calculations.
2. Define the significant terms associated with mechanics, electricity, light and measurement.
3. Describe and discuss the application of the physics concepts introduced related to a limited number of real world scenarios/devices.
4. Use laboratory equipment in a safe and accurate manner.
5. Report on and critically assess a range of experiments relating to the course content.

Learning and Teaching Methods

- Lectures: The lectures will introduce the theory content to the student.
- Practical programme: The practical element allows the student to put into practice the theoretical concepts covered in the lectures.
- Live and video-based demonstrations

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	36	
Lab	24	
Independent Learning	75	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	40%	
Lab Report	40%	1,2,3,4,5
Final Written Examination	60%	1,2,3

Assessment Criteria

<40%: The student has failed to demonstrate a reasonable grasp of mechanics, electricity, light and measurement and is unable to carry out routine calculations reliably. Experimental work is generally poor.

40%–49%: Able to demonstrate a basic understanding of the mechanics, electricity, light and measurement principles covered. Able to provide partial solutions to numerical problems. Practical work reaches an acceptable level.

50%–59%: Able to clearly describe and define basics concepts in mechanics, electricity, light and measurement. Able to analyse physical situations and apply suitable problem-solving techniques to find numerical solutions. Practical work is performed and reported on in a capable manner.

60%–69%: In addition to the above, able to apply problem-solving techniques to new similar problems. Demonstrates a good understanding of the majority of the course content. Good, clear reporting of practical work.

70%–100%: All the previous to an excellent level. Demonstrates an ability to put a numerical solution into a context and assess whether such solutions are meaningful. Can critically assess experiments undertaken.

Supplementary Material(s)

- Giancoli, G.C. *Physics, Principles with Applications.* UK: Prentice Hall, 2016.
- Johnson, K. *Physics for You.* UK: Stanley-Thornes, 2011.
- O'Regan, D. *Real-World Physics.* Dublin: Folens, 2000.

Requested Resources

- Science Lab: Physics