Physics II for Science and Engineering with Lab Course Descriptor

Course Code	LPHYS4125	Discipline	Physics and Engineering
UK Credit	20	US Credit	5
FHEQ Level	4	Date Approved	November 2022
Core Attributes	Engaging with the Natural and Designed World (ND) Analysing and Using Data (AD)		
Pre-Requisites	LPHYS4115 Physics 1 or equivalent LMATH4118 Mathematical Methods II or equivalent		
Co-Requisites	LMATH4138 Differential Equations and Linear Algebra		

Course Summary

This course is the second instalment of introductory calculus-based Physics. It focuses on the study of wave motion, electric fields and Coulomb's Law, Gauss' law, capacitors, resistors and DC electric circuits, magnetic fields, induction, radiation, and the basic properties of electromagnetic waves. These topics are reinforced with lab sessions. In the course, students learn to define and analyse the concepts of electric and magnetic phenomena acting in the real world and to mathematically quantify electricity, magnetism, and wave motion. These concepts will be explored on the revised definitions of SI units, in particular the new definition of ampere and related electrical quantities. Students will develop mathematical skills in order to solve physics related problems, perform and interpret the results of simple laboratory experiments and demonstrations of physical principles.

Learning Outcomes

On successful completion of the course, students will be able to:

Knowledge and Understanding

K1a Demonstrate an understanding of introductory physics theory.

K2a Demonstrate a fundamental understanding of the application of physics by focusing on electromagnetism, wave mechanics, and radiation.

K3a Demonstrate an understanding of the definition of SI units based on physical constants, and the implications of error on said measured constants.

Subject Specific Skills

S1a Perform and analyse simple physics experiments

S2a Solve basic physics problems concerning the areas of electromagnetism and wave motion.

Transferable and Professional Skills

T1a Acquire the ability of problem solving to a wide array of tasks.

T2a Perform evidence–based decision making.

T3a Display a developing technical proficiency in written English and an ability to communicate clearly and accurately in structured and coherent pieces of writing.

T3a Display a developing technical proficiency of written scientific and technical nomenclature that demonstrates an ability to communicate clearly and accurately when producing structured and coherent scientific or technical pieces.

Teaching and Learning

Teaching and learning strategies for this course will include:

A minimum of 50 contact hours, typically to include interactive group teaching, co-curriculars, individual meetings, in-class presentations, lab-based experiments and exams.

Course information and supplementary materials are available on the University's Virtual Learning Environment (VLE).

Students will receive individualised developmental feedback on their work for this course.

Students are required to attend and participate in all the formal and timetabled sessions for this course. Students are also expected to manage their directed learning and independent study in support of the course.

Assessment

Formative

Students will be formatively assessed in class through class activities, and during office hours. Formative assessments are ones that do not count towards the final grade but will provide students with developmental feedback.

Summative

AE:	Assessment Activity	Weighting (%)	Online submission	Duration	Length
1	Written Examination	10	No	1hr 45min	N/A
2	Written Examination	40	No	1hr 45min	N/A
3	Set Exercises	15	Yes	15-25 hours to complete	N/A
4	Written assignments	35	Yes		4000 Words

Further information on the structure of summative assessment elements can be found in the Summative Assessment Briefs.

Feedback

Students will receive feedback in a variety of ways: written (including via email correspondence); oral (within office hours or on an *ad hoc* basis) and indirectly through class discussion.

Feedback on examinations is provided through generic internal examiners' reports and are made available to the student on the VLE.

For all other summative assessment methods, feedback is made available to the student either via email, the VLE or another appropriate method.

Indicative Reading

Note: Comprehensive and current reading lists for courses are produced annually in the Course Syllabus or other documentation provided to students; the indicative reading list provided below is used as part of the approval/modification process only.

Books

- Randal Knight, Physics for Scientists and Engineers: A Strategic Approach with Modern Physics, Global Edition, 5th Edition
- Young & Freedman, University Physics with Modern Physics, 15th Edition

Electronic Resources

- Pearson Mastering Physics VLE
- Wolfram Mathmatica/MatLAB

Indicative Topics

- Electricity and Magnetism
- Wave motion
- Radiation

Title: LPHYS4125 Physics II for Science and Engineering with Lab Course Descriptor **Approved by: Academic Board** **Location: Academic Handbook/Programme specifications and Handbooks/Mobility**					
Version Number	Date Approved	Date Published	Owner	Proposed Next Review Date	Modification (As per AQF4) & Category Number
2.1	August 2023	August 2023	Dr James Kneller	November 2027	Category 1: Corrections/clarifications to documents which do not change approved content or learning outcomes. Category 3: Changes to Learning Outcomes.
2.0	October 2022	January 2023	Dr James Kneller	November 2027	Category 1: Corrections/clarifications to documents which

					do not change approved content or learning outcomes. Category 3: Changes to Learning Outcomes.
1.0	November 2022	November 2022	Dr James Kneller	November 2022	