1. **Title of the module**

PHYS0027 (PH027) - Introductory Physics Laboratory and Communication Skills

1. **School or partner institution which will be responsible for management of the module**

Physical Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 3

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn and Spring

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

Physics BSc with Foundation Year

This is not available as a wild module.

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

Have:

8.1 Knowledge and understanding of physical laws and principles, and their application to diverse areas of physics (this will include laws of motion, electromagnetism, wave phenomena and the properties of matter), with modules covering the necessary mathematics. (A1)

8.2 An ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions. (B1)

8.3 An ability to solve problems in physics using appropriate mathematical tools. (B2)

8.4 An ability to present and interpret information graphically. (C2)

8.5 An ability to communicate scientific information, in particular to produce clear and accurate scientific reports. (C3)

8.6 A familiarity with laboratory apparatus and techniques, including relevant aspects of Health & Safety. (C4)

8.7 The systematic and reliable recording of experimental data. (C5)

8.8 An ability to make use of appropriate texts, or other learning resources as part of managing their own learning. (C6)

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**

Have:

9.1 Problem-solving skills, an ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area. (D1)

9.2 Investigative skills in the context of independent investigation including the use of textbooks and other available literature, and the interaction with colleagues to extract important information. (D2)

9.3 Communication skills in the area of dealing with surprising ideas and difficult concepts, including listening carefully, reading demanding texts and presenting complex information in a clear and concise manner. (D3)

9.4 Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly. (D4)

9.5 Personal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people. (D5)

1. **A synopsis of the curriculum**

There will be laboratory sessions with eight experiments relating to both general skills and to the syllabus of the Physics lecture modules PH023, PH025 and PH026.

There will be lecture tutorials on:

* Introduction to the module
* Analysing experimental uncertainties
* Writing reports on laboratory work
1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Core texts:

* New Understanding Physics for Advanced Level 4th edition, by J. Breithaupt. (Copies of the 4th edition are in the library, + copies of earlier editions)
* L. Kirkup, Experimental Methods John Wiley & Sons, Australia, 1994

Supplementary texts:

* Physics by J. Breithaupt (Copies of 2003 edition in the library)
* J. R. Taylor, An Introduction to Error Analysis (Second Edition), University Science Books, US. 1997
* J. Topping, Errors of Observation and Their Treatment (Third Edition), Chapman and Hall, London, 1962
1. **Learning and teaching methods**

Total contact hours: 30

Private study hours: 120

Total study hours: 150

1. **Assessment methods**
	1. Main assessment methods

Lab report 1 (3 hr lab session, 25 %)

Lab report 2 (3 hr lab session, 25 %)

Lab report 3 (3 hr lab session, 25 %)

Lab Introduction Assignment 4 (3 hr lab session, 5 %)

Lab Appraisal Assignment 5 (3 hr lab session, 10 %)

Lab Appraisal Assignment 6 (3 hr lab session, 10 %)

13.2 Reassessment methods

Like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *8.7* | *8.8* | *9.1* | *9.2* | *9.3* | *9.4* | *9.5* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lectures |  | **X** | **X** | **X** | **X** |  |  |  |  |  | **X** | **X** |  |
| Laboratory sessions | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Self-study | **X** | **X** | **X** | **X** | **X** |  |  | **X** | **X** | **X** | **X** | **X** | **X** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Laboratory reports and appraisals | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lab Introduction Assignment |  | **X** | **X** |  |  |  |  |  | **X** |  |  | **X** | **X** |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Physics is an international subject with physical laws discovered and techniques developed and refined by scientists across the globe. Mastery of the subject-specific learning outcomes will equip students to apply the theories and techniques of this module in a wide range of international contexts. The module team is drawn from the School of Physical Sciences, which includes many members of staff with international experience of teaching and research collaboration. In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material. The support SPS provides to its students is also internationally attuned given our international student body.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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Revised FSO Jan 2018