1. **Title of the module**

PHYS6020 (PH602) - Physics Problem Solving

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 6

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

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

None

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

BSc/BSc with Foundation Year/MPhys Physics

BSc/MPhys Physics with Astrophysics

This is not available as an elective module.

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

8.1 Demonstrate an assured ability to identify relevant principles and laws when dealing with physics problems, and to make approximations necessary to obtain solutions.

8.2 Confidently solve problems in physics using appropriate mathematical tools.

8.3 Demonstrate competent use of appropriate C&IT packages/systems for the analysis of data and the retrieval of appropriate information for problem solving.

8.4 Present and interpret scientific information graphically to solve complex problems.

8.5 Communicate scientific information about problem solving, in particular to produce clear and accurate scientific reports.

8.6 Demonstrate an ability to make use of appropriate physics-based texts, research-based materials or other learning resources as part of managing their own learning.

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

9.1 Demonstrate comprehensive problem-solving skills, in the context of both problems with well-defined solutions and open-ended problems; 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.

9.2 Demonstrate 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.

9.3 Demonstrate the ability to work independently, to use initiative, to organise oneself to meet deadlines.

1. **A synopsis of the curriculum**

After taking the classes students should be more fluent and adept at solving and discussing general problems in Physics (and its related disciplines of mathematics and engineering).

There is no formal curriculum for this course, which uses and demands only physical and mathematical concepts with which the students at this level are already familiar.

Problems are presented and solutions discussed in topics spanning several topics in the undergraduate physics curriculum (Mechanics and statics, thermodynamics, and optics, etc).

Problems are also discussed that primarily involve the application of formal logic and reasoning, simple probability, statistics, estimation and linear mathematics.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Oman and Oman, Physics for the Utterly Confused, McGraw Hill [QC23]

3000 Solved Problems in Physics, Alvin Halpern (ISBN 978-0-07-176346-2

1. **Learning and teaching methods**

Total contact hours: 20

Private study hours: 130

Total study hours: 150

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

Assignment 1 (10 hours) – 20%

Assignment 2 (10 hours) – 20%

Examination (3 hours) – 60%

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* | *9.1* | *9.2* | *9.3* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |
| **Private Study** | **X** | **X** |  |  |  | **X** | **X** | **X** | **X** |
| *Workshop* | **X** | **X** | **X** | **X** | **X** |  | **X** | **X** |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |
| *Assignment* | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| *Examination* | **X** | **X** | **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 Physicists 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 delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 10/07/2019 | Minor | September 2019 | 13 |  |
|  |  |  |  |  |