1. **Title of the module**

Waves and Fields (PHYS3220/PH322)

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

School of Physical Sciences

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

Level 4

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)**

Term 2

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

None

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

Physics (BSc, BSc with Foundation Year, BSc with a Year in Industry, MPhys, MPhys with a Year Abroad)

Physics with Astrophysics (BSc, BSc with a Year in Industry, MPhys, MPhys with a Year Abroad)

Astronomy Space Science and Astrophysics (BSc, BSc with a Year in Industry, MPhys, MPhys with a Year Abroad)

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:**
2. Demonstrate knowledge and understanding of the laws of physics for waves and introductory electromagnetism.
3. Demonstrate knowledge and understanding of physical quantities, their units, and typical values, for waves and introductory electromagnetism.
4. Demonstrate knowledge and understanding of physical phenomena, the terminology used to describe them, and typical circumstances in which they are found to occur, for waves and introductory electromagnetism.
5. Formulate and solve problems in waves and introductory electromagnetism.
6. Quantitatively describe and predict waves and introductory electromagnetism phenomena using mathematics.
7. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
8. Demonstrate problem solving skills.
9. Demonstrate investigative skills (including information retrieval).
10. Demonstrate analytical skills (including working with details and evaluating ideas).
11. Demonstrate personal skills working independently (e.g. to use initiative and originality, be organised and meet deadlines).
12. Demonstrate ICT skills (e.g. to use Moodle and internet resources).
13. **A synopsis of the curriculum**

This module examines key physical phenomena of waves and fields which extend over time and space. The first part presents a mathematical description of oscillations and develops this to a description of wave phenomena. The second part is an introduction to electromagnetism which includes electric and magnetic fields before providing an introduction to the topic of electrical circuits.

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

Tipler, P. and Mosca, G.; 2008; *Physics for Scientists and Engineers (6th Ed.)*; Palgrave Macmillan

Nahvi, M. and Edminister, J.; 2003; *Schaum's outline of theory and problems of electric circuits*; McGraw-Hill

1. **Learning and teaching methods**

Total contact hours: 30

Private study hours: 120

Total study hours: 150

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

Problem Set 1 (4 hours) – 10%

Problem Set 2 (4 hours) – 10%

Examination (2 hours) – 80%

13.2 Reassessment methods

Like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section 12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| Private Study | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Problem Solving | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures | **X** | **X** | **X** | **X** | **X** | **X** |  | **X** |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| Problem Sets | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Examination | **X** | **X** | **X** | **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**

The topics to be covered in this module were developed collaboratively by scientists in many countries over the course of centuries. Throughout the teaching of this module emphasis will be made on how contributions from scientists in different countries, each having their own science culture, interacted to create the knowledge we have today, which like all established scientific knowledge transcends national boundaries.

**DIVISIONAL 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) |
| Jan 2021 | Major | Sept 2021 | 1;8;9;10;13;14 | Yes |
|  |  |  |  |  |