1. **Title of the module**

PHYS5030 (PH503) - Atomic Physics

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 5

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)**

Spring

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

PH502 – Quantum Mechanics

PH588 – Maths

PH504 - Electromagnetism

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 Year Abroad)

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

Astronomy Space Science and Astrophysics (BSc, BSc with a year in industry, MPhys, MPhys with 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:**

8.1 Demonstrate knowledge and understanding of physical laws and principles in Quantum and Atomic Physics, and their application to diverse areas of physics

8.2 Identify relevant principles and laws when dealing with problems in Quantum and Atomic Physics, and to make approximations necessary to obtain solutions.

8.3 Solve problems in Quantum and Atomic Physics using appropriate mathematical tools.

8.4 Use mathematical techniques and analysis to model physical behaviour in Quantum and Atomic Physics.

8.5 To present and interpret information graphically.

8.6 To make use of appropriate 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 Use problem-solving skills, in the context of both problems with well-defined solutions and open-ended 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.

1. **A synopsis of the curriculum**

This module will build on the general principles of quantum mechanics introduced earlier in the degree and applied them to the description of atoms, starting by the description of the hydrogen atom and covering other topics such as the effect of magnetic fields on an atom or X-ray spectra.

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

* Quantum mechanics - Bransden, B. H., Joachain, C. J. 2000
* Introduction to the Structure of Matter – Brehm, J.J. and Mullin, W.J. 1989
* Atomic Physics – Jones, D.G.C. 1997

1. **Learning and teaching methods**

Total contact hours: 32

Private study hours: 118

Total study hours: 150

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

Coursework (30 hrs) 30%, consisting of

* + Homework 1 (10 hours, 15%)
  + Homework 2 (10 hours, 15%)

Exam (2 hours) 70%

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* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **x** | **x** | **x** | **x** | **x** |  |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |
| Coursework | **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 laws of physical sciences discovered and techniques developed and refined by physical scientists across the globe. Mastery of the subject-specific learning outcomes in this module will equip students to apply the learned theories and techniques in a wide range of international contexts. In compiling the reading list, consideration has been given to the range of texts that are available internationally. The support SPS provides to its students is also attuned to 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) |
| 01/05/2020 | Minor | January 2021 | 10, 12 |  |
|  |  |  |  |  |