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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | **YES** | | **NO** |
| 1. New module (if yes, complete numbers 3-8, 10-14) Title of module: | | | | | | | | |  | | x |
| 1. Revised module (if yes, complete numbers 3-14) Title and SDS/KV codes:   PHYS5070 (PH507) – The Multiwavelength Universe and Exoplanets | | | | | | | | | x | |  |
| 1. State which stage this module will be applicable to (information required by KentVision)   Stage 2 | | | | | | | | | | | |
| 1. Is this module (or any consequently withdrawn modules) compulsory in any programmes   (i) in the School which owns the module? | | | | | | | | | x | |  |
| (ii) in programmes owned by other Schools? | | | | | | | | |  | | x |
| 1. Does the introduction/revision of this module, or the withdrawal of other modules, potentially require changes to those programmes? | | | | | | | | | x | |  |
| 1. If so, are those potential changes the result of:   (i) Changes to the Learning Outcomes of this module? | | | | | | | | |  | |  |
| (ii) Changes to the term(s) in which this module is delivered? | | | | | | | | |  | |  |
| (iii) Changes to pre- and co-requisite modules? | | | | | | | | |  | |  |
| (iv) Other (please specify) Name change as a result of programme-wide curriculum review. | | | | | | | | | x | |  |
| 1. If the answer to any of questions 4.2 to 6 is Yes - confirm that all the owners of the programmes listed in section 7 of the specification have been informed | | | | | | | | | x | |  |
| 1. Will any modules be withdrawn as a result of the introduction of this module/changes to the module? *If yes, please provide the module code and title and information required (see Annex B of the Code of Practice* [*https://www.kent.ac.uk/teaching/qa/codes/taught/annexb.html*](https://www.kent.ac.uk/teaching/qa/codes/taught/annexb.html)*)* | | | | | | | | |  | | x |
| 1. Please indicate which sections of the specification have been revised. NB the approval panel will look at the whole specification and may comment on sections that have not been revised in this submission | | | | | | | | |  | | |
| 1 | 2 | 3 | 4 | 5 | 6 x | 7 | 8 x | |
| 9 x | 10 x | 11 | 12 x | 13 | 14 x | 15 | 16 | |
| 17 x | 18 | 19 |  |  |  |  |  | |
| 1. Are there any implications for learning resources, including staff, library, IT and space? If yes, please confirm the School has considered and planned for the allocation of the resources required | | | | | | | | |  | | x |
| 1. Term and year the revised version/new module will start   Term 2 2022-23 | | | | | | | | | | | |
| 1. Date this version of the module specification was approved by the School EC or GSC (and Board of Studies if appropriate)   July 2020 | | | | | | | | | | | |
| 1. Rationale: please provide any contextual information that will assist members of the approval panel who may not be familiar with the discipline and custom and practice in your School   *Module has been reviewed as part of the new Physics, Physics with Astrophysics and ASSA programmes. The new programmes have been developed with three main objectives: 1) keep the programme coherent, relevant and attractive, 2) optimise resources in delivery, 3) align with the new accreditation guidelines provided by the Institute of Physics (released in 2020).* | | | | | | | | | | | |
| 1. Please provide any additional information that may assist the approval panel, for example the rationale for assessment or an explanation of the learning and teaching methods if these vary from a commonly seen pattern | | | | | | | | | | | |
| 1. High risk of non-delivery: confirm that more than one person is available to teach this module and that the School Plan includes consideration of resources, cover and succession planning | | | | | | | | x | |  | |
| 1. School/Faculty to confirm that consideration has been given to the title and curriculum description to ensure these are not overly constraining | | | | | | | | x | |  | |

***Please complete this proforma if this is a request for a module AMENDMENT. Delete it if this is NOT for an amendment and use the NEW module proforma on previous page***

|  |  |
| --- | --- |
| MODULE CHANGE REQUEST  Note : Date the changes take effect must be supplied in order for these changes to be made | |
| Module Code:  PHYS5070 (PH507) | **Change Required:**  **Review of learning outcomes, in line with the new programmes for Physics, Physics with Astrophysics and Astronomy, Space Science and Astrophysics programmes. The review to these programmes follows the release of new accreditation guidelines by the Institute of Physics** |
| Current Module Title:  The Multiwavelength Universe and Exoplanets | |
| New Module Title:  Observational Astronomy and Exoplanets | |
| Add a delivery Campus: |  |
| Change week beginning: | |
| Credit Change From: (no change) | **To:** |
| Change to Assessment Pattern:  Detailed Assessment Pattern Component Breakdown:     |  |  | | --- | --- | | Problem set 1 | 15% | | Problem set 2 | 15% | | Examination | 70% | | |
| Change in reassessment method: | |
| Date changes take effect: Academic Year 2022-23 | |
| Notes: | |

1. **Title of the module**

Observational Astronomy and Exoplanets (PHYS5070/PH507)

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 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)**

Term 2

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

PH304 Introduction to Astronomy and Light

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

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)

Optional for Physics (BSc, BSc with Foundation Year, 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:**

* 1. Apply fundamental principles of physics to particular areas, such as atomics physics and spectroscopy.
  2. Demonstrate knowledge and understanding of physical quantities, their units, and typical values, for observational astronomy and exoplanets.
  3. Demonstrate knowledge and understanding of physical phenomena, the terminology used to describe them, and typical circumstances in which they are found to occur, for observational astronomy and exoplanets.
  4. Demonstrate knowledge and understanding of the application of physical principles to astrophysics (generally including but need not be limited to): the structure, formation and evolution of stars and galaxies, planetary systems, and cosmology.
  5. Formulate and solve problems about observational astronomy and exoplanets.
  6. Quantitatively describe and predict astronomy problems in the area of observational astronomy and exoplanets using mathematics.
  7. Demonstrate an awareness of, and ability to apply, cross-cutting principles in different areas of physics
  8. Comment critically on how telescopes operating at various wavelengths are used in astronomy and astrophysics research.

1. **The intended generic learning outcomes.**

**On successfully completing the module students will be able to:**

* 1. Demonstrate problem solving skills.
  2. Demonstrate investigative skills (including information retrieval).
  3. Demonstrate analytical skills (including working with details and evaluating ideas).
  4. Demonstrate personal skills working independently (e.g. to use initiative and originality, be organised and meet deadlines).
  5. Demonstrate ICT skills (e.g. to use Moodle and internet resources).

1. **A synopsis of the curriculum**

This module builds on the brief introduction to astronomy previously taught in earlier stages. Students enhance their knowledge of astrophysics through the study of the theory, formalism and fundamental principles developing a rigorous grounding in observational, computational and theoretical aspects of astrophysics. In particular they study topics such as properties of galaxies and stars and the detection of planets outside the solar system.

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

* Carroll, B. and Ostlie, D.; 2013; *An Introduction to Modern Astrophysics*;
* Berry, M.; 1989; *Principles of Cosmology and Gravitation*; Adam Hilger
* Roos, M.; 2015; *Introduction to Cosmology*; Wiley
* Peacock, J.; 1999; *Cosmological Physics*; Cambridge University Press

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 (10 hours) 15%

Problem set 2 (10 hours) 15%

Examination (2 hours) 70%

At least one of the Problem sets must be passed in order to pass the module.

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 | 8.6 | 8.7 | 8.8 | 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** | **X** | **X** | **X** |
| Problem Solving | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |  | **X** |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Problem sets | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Examination | **X** | **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 generations. Throughout this module emphasis will be made on how contributions from scientists in different countries (with different science cultures) were combined to create the knowledge we have today.  Like all established scientific knowledge, this transcends national boundaries*.*

**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) |
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