***Note:*** *This sheet does not form part of the specification and will not be published. The information on this sheet provides contextual and supporting information for the approval process and should provide answers to questions that commonly arise in the consideration of new and revised modules. Please type directly into the form, boxes will expand as needed.*

***NB: specifications with errors in formatting, typos and/or on incorrect or incomplete templates will not be considered for approval until corrected.***

|  |  |  |
| --- | --- | --- |
|  | **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:

PHYS6210 (PH621) – Analytical Mechanics | x |  |
| 1. State which stage this module will be applicable to (information required by KentVision)

*Level 6 (Stage 3)* |
| 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 Is this module (or any consequently withdrawn modules) compulsory in any programmes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) |  |  |
| 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
 |  |  |
| 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 Will any modules be withdrawn as a result of the introduction of this module/changes to the module?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 x | 6  | 7  | 8  |
| 9  | 10 x | 11  | 12 x | 13 x  | 14 x | 15  | 16  |
| 17  | 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

*Autumn 2020-21* |
| 1. Date this version of the module specification was approved by the School EC or GSC (and Board of Studies if appropriate)

Approved through Physics EC team remotely on 31/03/20 |
| 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

*This module had absorbed a group project component necessary for accreditation purposes with the Institute of Physics. As a result the load on students for a 15 credit module was unbalanced with respect to other equivalent modules. We have rebalanced the work that the students are required to by implementing the group project element in PS700 (Physical Science Research Investigation), where it substitutes an individual project.* |
| 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 REQUESTNote : Date the changes take effect must be supplied in order for these changes to be made  |
| Module Code: PHYS6210 (PH621) – Analytical Mechanics | **Change Required:**Removal of group project component from assessments and learning and teaching methods |
| Current Module Title: (PH621) – Analytical Mechanics |
| New Module Title:  (PH621) – Analytical Mechanics |
| Add a delivery Campus: Canterbury |  |
| Change week beginning: Term 1 |
| Credit Change From: (no change) | **To:**  |
| Change to Assessment Pattern: Detailed Assessment Pattern Component Breakdown:

|  |  |
| --- | --- |
| *Assignment 1 (10 hours)* | *15%* |
| *Assignment 2 (10 hours)* | *15%* |
| *Final Examination (2 hours)\*\** | *70%* |

 |
| Change in reassessment method:  |
| Date changes take effect: Academic Year 2020-21 |
| Notes: |

1. **Title of the module**

PHYS6210 (PH621) - Analytical Mechanics

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 6

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

15 (ECTS 7.5)

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

Term 1

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

Prerequisites

PHYS3110 (PH311),

PHYS3120 (PH312),

PHYS3210 (PH321),

PHYS5880 (PH588),

PHYS5020 (PH502)

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

Physics (MPhys)

Physics with Astrophysics (MPhys)

Astronomy, Space Science and Astrophysics (MPhys)

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**
	1. Demonstrate knowledge and understanding of physical laws and principles of mechanics, and their application to diverse areas of physics.
	2. Demonstrate an ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions.
	3. Demonstrate an ability to solve problems involving mechanics using appropriate mathematical tools
	4. Demonstrate an ability to use mathematical techniques and analysis to model physical behaviour involving mechanics.
	5. Demonstrate an ability to present and interpret information relating to mechanics graphically.
	6. Demonstrate an ability to make use of appropriate texts, research-based materials or other learning resources about mechanics as part of managing their own learning.
	7. Demonstrate an ability to communicate scientific information, in particular to produce clear and accurate scientific reports.
2. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**
	1. Demonstrate a knowledge and understanding of 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.
	2. Demonstrate a knowledge and understanding of 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.
	3. Demonstrate a knowledge and understanding of investigative skills in the context of independent investigation including the use of textbooks and other available literature, databases, and the interaction with colleagues to extract important information.
	4. Demonstrate 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. C&IT skills are an important element to this.
	5. Demonstrate personal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people.
3. **A synopsis of the curriculum**

This module is an introduction to the developments in classical mechanics since the time of Newton. In it, students will learn a variety of methods to formulate complex problems in classical systems and classify different types of dynamics that may occur.

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

Hand and Finch, Analytical Mechanics (Cambridge University Press, 1998, ISBN 9780511801662)

Landau and Lifshitz, Mechanics: Volume 1 of course of Theoretical Physics (Butterworth-Heinemann, 3Rd Revised edition, 1976, ISBN 9780750628969)

Strogatz: Nonlinear dynamics and Chaos (Westview Press, 2nd edition, 2014, ISBN 9780813349107)

1. **Learning and teaching methods**

36 Contact hours

114 Private study hours

Total study time 150 hours

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

Coursework Assignments (20%), (30 hrs), consisting of:

1. Homework 1: (15%)
2. Homework 2: (15%)

Examination (70%)

* 1. 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* | *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** |
| Lectures | **x** | **x** | **x** | **x** | **x** |  |  | **x** | **x** |  |  |  |
| Workshops |  | **x** | **x** |  |  |  |  | **x** | **x** | **x** | **x** |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |
| Assignments | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |  | **x** |
| Examination | **x** | **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**

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 the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 10/07/2019 | Minor | September 2019 | 6, 12, 13 |  |
| 01/05/2020 | Minor | September 2020 | 5, 8, 10, 12, 13, 14 |  |