1. KentVision Code and title of the module

PHYS0022 – Graphical Methods for Physical Scientists

## Division and School/Department or partner institution which will be responsible for management of the module

Division of Natural Sciences (Physics and ASSA)

## The level of the module (Level 4, Level 5, Level 6 or Level 7)

Level 3

## The number of credits and the ECTS value which the module represents

15 Credits (7.5 ECTS)

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

Autumn

## Prerequisite and co-requisite modules and/or any module restrictions

None

## The course(s) of study to which the module contributes

Compulsory for the following courses:

BSc (Hons) Chemistry with a Foundation Year

BSc (Hons) Forensic Science with a Foundation Year

BSc (Hons) Physics with a Foundation Year

Not available as an elective module

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

8.1 Represent and analyse lines, curves (including quadratics) and circles.

8.2 Know trigonometric and related functions and solve equations involving them.

8.3 Represent, manipulate, and analyse vectors and their properties.

8.4 Apply the above graphical methods in modelling phenomena in physical sciences.

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

9.1 Demonstrate 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.

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 an ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact with other people.

9.4 Demonstrate numeracy and computational skills, including such aspects as correct use of units and modes of data presentation.

## A synopsis of the curriculum

Graphical methods are powerful, visual tools to illustrate relationships in theories, and in experimental quantities, pertaining to physical phenomena. They involve knowledge of, and visual representation of mathematical functions frequently encountered in the physical sciences. The topics covered are expected to include:

* Graphs of functions including straight lines, quadratics, 1/x and 1/x2.
* Parametric equations for curves, including use in modelling phenomena in physical sciences.
* Coordinate geometry of lines and circles, including calculations with angles in radians.
* Trigonometric functions (sine, cosine, tangent), and reciprocal and inverse trigonometric functions.
* Formulae involving small angles, sums of angles, and products of trigonometric functions.
* Solving trigonometric equations in the context of modelling phenomena in physical sciences.
* Vectors in one, two and three dimensions, and notations for representing them.
* Algebraic operations of vector addition and multiplication by scalars.
* Use of vectors in modelling phenomena in physical sciences.

## Reading list

## The University is committed to ensuring that core reading materials are in accessible electronic format in line with the Kent Inclusive Practices.

## The most up to date reading list for each module can be found on the university's [reading list pages](https://kent.rl.talis.com/index.html).

## Contact Hours

Private Study: 125

Contact Hours: 25

Total: 150

## Assessment methods

13.1 Main assessment methods

* Moodle Quiz 1 (1 hour) – 15%
* Moodle Quiz 2 (1 hour) – 15%
* Examination (2 hours) – 70%

13.2 Reassessment methods

* Like-for-like

## Map of module learning outcomes (sections 9 & 10) to learning and teaching methods (section 13) and methods of assessment (section 14)

**Module learning outcomes against learning and teaching methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lecture | **x** | **x** | **x** | **x** |  |  |  |  |
| Workshop | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

**Module learning outcomes against assessment methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Moodle Quizzes | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

## Inclusive module design

The Division 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

## Campus(es) or centre(s) where module will be delivered

Canterbury

## Internationalisation

Science is an international discipline with widely applicable international resonance. This module presents subject-specific knowledge generated, developed, and refined by scientists around the world. Mastery of the learning outcomes will equip students to apply the knowledge in a wide range of international contexts and these will be addressed in making the content relevant to current global issues. The Division of Natural Sciences is an international community of students and staff and group activities and teaching will provide a platform for internationally-focussed discussion.

**DIVISIONAL USE ONLY**

**Module record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

| Date approved | New/Major/minor revision | Start date of delivery of (revised) version | Section revised  (if applicable) | Impacts PLOs (Q6&7 cover sheet) |
| --- | --- | --- | --- | --- |
| 10 Jul 2019 | Minor | Sept 2019 | 13-14 | No |
| 9 Dec 2021 | Minor | Sept 2022 | 12 | No |