1. **Title of the module**

MAST0022 (MA022) - Graphs, Geometry and Trigonometry

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

School of Mathematics, Statistics and Actuarial Science

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

Level 3

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)**

Autumn and Spring

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

Pre-requisite: an achievement at A-level (or equivalent) that is sufficient for entry into the Foundation year.

Co-requisite: None

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

BEng (Hons) Electronic and Communications Engineering with a Foundation Year, BEng (Hons) Computer Systems Engineering with a Foundation Year, BSc (Hons) Forensic Science with a Foundation Year, BSc (Hons) Mathematics with a Foundation Year, BSc (Hons) Actuarial Science with a Foundation Year, BSc (Hons) Chemistry with a Foundation Year

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

8.1 demonstrate understanding of the basic body of knowledge associated with standard functions and their graphical interpretation, geometry, trigonometry and vectors;

8.2 demonstrate the capability to solve problems in accordance with the basic theories and concepts of functions, trigonometry and geometry, whilst demonstrating a reasonable level of skill in calculation and manipulation of the material;

8.3 apply the basic techniques associated with functions, trigonometry and geometry in several well-defined contexts;

8.4 demonstrate mathematical proficiency suitable for Stage 1 entry.

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

Demonstrate an increased ability to:

9.1 manage their own learning and make use of appropriate resources;

9.2 understand logical arguments, identifying the assumptions made and the conclusions drawn;

9.3 communicate straightforward arguments and conclusions reasonably accurately and clearly;

9.4 manage their time and use their organisational skills to plan and implement efficient and effective modes of working;

9.5 solve problems relating to qualitative and quantitative information.

9.6 demonstrate an increased level of skill in numeracy and computation.

1. **A synopsis of the curriculum**

This module introduces fundamental methods needed for the study of mathematical subjects at degree level.

a) Functions and graphs: plotting, roots, intercepts, turning points, area (graphical methods), co-ordinate geometry of straight lines, parallel and perpendicular lines, applications to plots of experimental data, quadratics, introduction to the trigonometric functions

b) Trigonometry: radians, properties of sine and cosine functions, other trigonometric functions, compound angle formulae and subsequent results, solving trigonometric equations

c) Geometry: circles and ellipses, right-angled triangles, SOHCAHTOA, trigonometric functions, inverse trigonometric functions, sine and cosine rule, opposite and alternate angle theorems, applications to geometry problems

d) Vectors: notion of a vector, representation of vectors, addition, subtraction and scaling, magnitude, scalar product, basis vectors in 2 and 3 dimensions

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

Core Maths for Advanced Level, L Bostock and S Chandler, Nelson Thornes Ltd, 2013.

1. **Learning and teaching methods**

Total contact hours: 44

Private study hours: 106

Total study hours: 150

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

Assessment 1 Exercises, requiring on average between 5 and 8 hours to complete 5%

Assessment 2 Exercises, requiring on average between 5 and 8 hours to complete 5%

Assessment 3 Exercises, requiring on average between 5 and 8 hours to complete 5%

Assessment 4 Exercises, requiring on average between 5 and 8 hours to complete 5%

Examination 2 hours 80%

The coursework mark alone will not be sufficient to demonstrate the student’s level of achievement on the module.

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 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures and exercise classes | **x** | **x** | **x** | **x** |  | **x** | **x** |  | **x** | **x** |
| Revision lectures | **x** | **x** | **x** |  |  | **x** | **x** |  | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Coursework | **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**

Mathematics is an international language with techniques developed and refined by mathematicians across the globe. Mastery of the subject-specific learning outcomes, 8.1 to 8.3, will equip students to apply the theories and techniques of this module in a wide range of international contexts. The module team is drawn from the School of Mathematics, Statistics and Actuarial Science, which includes many members of staff with international experience of teaching and research collaboration.

In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material.

The support SMSAS provides to its students is also internationally attuned given 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.**

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| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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Revised FSO Jan 2018