1. **Title of the module**

MACT6009 (MA6509) - Financial Mathematics.

MACT7009 (MA7509) - Financial Mathematics.

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 6 (MACT6009), Level 7 (MACT7009)

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

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

None

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

Level 6 module: BSc Actuarial Science (including programme with a Year in Industry)

Level 7 module: PDip in Actuarial Science, International Masters in Applied Actuarial Science

1. **The intended subject specific learning outcomes.  
   On successfully completing the Level 6 module students will be able to:**

8.1. demonstrate systematic understanding of key aspects of actuarial modelling;

8.2. describe, interpret and discuss the theories on interest rates;

8.3. demonstrate the capability to deploy established approaches accurately to analyse and solve problems using a reasonable level of skill in calculation and manipulation of the material in the syllabus areas outlined in Section 10;

8.4 demonstrate a basic appreciation of recent developments in financial mathematics and the links between the theory of financial mathematics and their practical application.

**On successfully completing the Level 7 module students will be able to:**

8.5. demonstrate systematic understanding of the key aspects and concepts involved in actuarial modelling;

8.6. describe, interpret and discuss critically the theories on interest rates;

8.7. show a comprehensive understanding of the techniques applicable to solve complex problems using a very good level of skill in calculation and manipulation of the material in the syllabus areas outlined in Section 10;

8.8 demonstrate a conceptual understanding that enables the student to evaluate critically recent developments in financial mathematics and the links between the theory of financial mathematics and their practical application.

1. **The intended generic learning outcomes.  
   On successfully completing the Level 6 module students will be able to:**

9.1 apply a logical mathematical approach to solving problems;

9.2 demonstrate skills in written communication;

9.3 demonstrate skills in the use of relevant information technology;

9.4 demonstrate skills in time management, organisation and studying.

**On successfully completing the Level 7 module students will be able to:**

9.5. apply a logical mathematical approach to solving complex problems including cases where information/data is not complete;

9.6. demonstrate skills in communication to both technical and non-technical audiences;

9.7. demonstrate skills in the use of relevant information technology;

9.8. demonstrate skills in time management, organisation and studying so that tasks can be planned and implemented at a professional level.

1. **A synopsis of the curriculum**

The aim of this module is to provide a grounding in the principles of modelling as applied to financial mathematics – focusing particularly on deterministic models which can be used to model and value known cashflows.

This module will cover a number of syllabus items set out in Subject CM1 – Actuarial Mathematics published by the Institute and Faculty of Actuaries.

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

Students on the programmes listed in section 7 are provided with the study notes published by the Actuarial Education Company for Subject CM1 – Actuarial Mathematics.

The following may be used for background reading:

Adams, A. T., et al, Investment mathematics (Wiley 2003)

McCutcheon, J. J., Scott, W. F., An introduction to the Mathematics of Finance (Institute of Actuaries, Faculty of Actuaries in Scotland 1986)

Garrett S, An introduction to the Mathematics of Finance; a deterministic approach 2nd edition (Institute and Faculty of Actuaries 2013)

1. **Learning and teaching methods**

Total contact hours: 48

Private study hours: 102

Total study hours: 150

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

**Level 6**

Assessment 1 In-course test - requiring on average between 10 and 15 hours to prepare 10%

Assessment 2 Timed practical assessment (Excel computing exercise) - requiring on average between 15 and 25 hours to prepare 20%

Examination 2 hours 70%

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

**Level 7**

Assessment 1 In-course test - requiring on average between 5 and 8 hours to prepare 5%

Assessment 2 Timed practical assessment (Excel computing exercise) - requiring on average between 12 and 18 hours to prepare 15%

Assessment 3 Exercises, requiring on average between 10 and 15 hours to complete 10%

Examination 2 hours 70%

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 (section 12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 6 Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 9.1 | 9.2 | 9.3 | 9.4 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Assessment 1 | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Assessment 2 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 7 Module learning outcome** | 8.5 | 8.6 | 8.7 | 8.8 | 9.5 | 9.6 | 9.7 | 9.8 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Assessment 1 | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Assessment 2 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assessment 3 | **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**

Actuarial Science is an international subject with techniques developed and refined by actuaries, mathematicians and statisticians across the globe. Mastery of the subject-specific learning outcomes (section 8) will equip students to apply the 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.

Examples with an international dimension are included in the module where appropriate.

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.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 23/01/2019 | Major | September 2019 | 1, 3, 8, 13 |  |
|  |  |  |  |  |