1. **Title of the module**

MACT4012 (MA4512) 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 4

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)**

Spring

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

Prerequisite: MACT4013 (Actuarial Practice 1)

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

BSc Actuarial Science (including programme with a Year in Industry), BSc Actuarial Science with a Foundation Year

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**
   1. describe, interpret and discuss the theories on interest rates;
   2. demonstrate the capability to deploy established approaches accurately to analyse and solve problems using a basic level of skill in calculation and manipulation of interest rate theories and using models to value cashflows;
   3. demonstrate a basic appreciation of recent developments in financial mathematics and the links between the theory of financial mathematics and their practical application.
2. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
   1. apply a logical mathematical approach to solving problems;
   2. demonstrate skills in written communication;
   3. demonstrate skills in the use of relevant information technology;
   4. demonstrate skills in time management, organisation and studying.
3. **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. Indicative topics covered by the module include data and basics of modelling, theory of interest rates, equation of value and its applications. 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

Assessment 1 In-course test - requiring on average between 10 and 15 hours for preparation 10%

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

Examination 2 hours 70%

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

* 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 | 9.1 | 9.2 | 9.3 | 9.4 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Computer classes / Lectures | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |
| Examination | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Assessment 1 | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assessment 2 | **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) |
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Revised FSO Jan 2019