PROGRAMME DETAILS

Programme Code: F1CM-COM
Department: Mathematics
Main Award: MSC - Master of Science
Full Award Title: Master of Science in Computational Mathematics
Level: Postgraduate Taught

LOCATION OF STUDY

<table>
<thead>
<tr>
<th></th>
<th>Edinburgh</th>
<th>Y</th>
<th>Scottish Borders</th>
<th>N</th>
<th>Orkney</th>
<th>N</th>
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<tbody>
<tr>
<td>Dubai</td>
<td>N</td>
<td></td>
<td>Malaysia</td>
<td>N</td>
<td>Approved Learning Partner</td>
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<tr>
<td>Independent Distance Learners</td>
<td>N</td>
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<td>Collaborative Learning Partner</td>
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<td>Other</td>
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ASSOCIATED AWARDS

<table>
<thead>
<tr>
<th>Programme Code</th>
<th>Award</th>
<th>Title</th>
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<tbody>
<tr>
<td>F1CC-ZZZ</td>
<td>PGCERT</td>
<td>Postgraduate Certificate in Computational Mathematics</td>
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<tr>
<td>F1CD-COM</td>
<td>PGDIP</td>
<td>Postgraduate Diploma in Computational Mathematics</td>
</tr>
<tr>
<td>F1CM-COM</td>
<td>MSC</td>
<td>Master of Science in Computational Mathematics</td>
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</table>

ACCREDITATION

N/A

LEARNING OUTCOMES – SUBJECT MASTERY

Understanding, Knowledge and Cognitive Skills

- Extensive detail and critical understanding of the core areas and issues in mathematical sciences, and scientific computation.
- Crucial comprehension of central topics in computational mathematics and applied mathematics and modelling.

Scholarship, Enquiry and Research (Research Informed Learning)

- Expertise in range of techniques in applied and computational mathematics and scientific computing
- Extensive skills in use of computers to solve problems in mathematics and scientific computing.

LEARNING OUTCOMES – PERSONAL ABILITIES

Industrial, Commercial and Professional Practice

- Develop critical awareness of current practices within the applied mathematical sciences, its applications scientific computing and modelling.
- Develop a capability for critically reflecting on roles and responsibilities.

Autonomy, Accountability and Working With Others

- Communicate effectively at all levels using a range of media.
- Plan and organise through self management and time management, assess issues associated with working as part of a team.
- Proficient skills in computer environments to present and communicate and problem solve

Communication, Numeracy & Information and Communications Technology
• Develop and demonstrate skills in writing and giving presentations
• Develop and demonstrate skills in computer environments to present and communicate and problem solve

**APPROACHES TO TEACHING AND LEARNING**

The approach in the programme is student focussed and is designed to encourage students to take responsibility for their own development and learning. Students interaction with the material is through a number of different methods. Within the timetable modules offer traditional lecture based material and a variety of laboratory based practicals. All the modules have a measure of coursework ranging from traditional solution to mathematics problems, use of specialized software, to discursive type assignments and interpretation of mathematical results to real-life problems. Approaches to teaching and learning are continuously reviewed with regard to the students and the subject area. Specific details are provided in the appropriate module descriptors.

**EDUCATIONAL AIMS OF THE PROGRAMME**

The aims of the programme are to enable students to:

• Develop detailed knowledge and understanding into the central areas of applied computational mathematics and scientific computations
• Cultivate skills in key areas of analysis and applications of computational mathematics.
• Develop original and creative solutions to problems in the computational applied mathematical sciences
• Communicate and work effectively with peers and academic staff demonstrating appropriate levels of autonomy and responsibility
• Plan and execute a significant research project or investigation in mathematical sciences demonstrating extensive details and critical understanding of the area and context of mathematical computation.

**ASSESSMENT POLICIES**

Student performance is determined by separate elements of assessment within the programme.

Coursework assessment takes place throughout the taught component.

Assessment contains summative and formative components which enable students to achieve learning outcomes which cannot be appropriately tested in traditional examinations.

Each course will have an examination (normally two hours) and the examination mark will be combined with the coursework mark to produce a single mark for the course.

Dissertations marks will be agreed with the internal readers, external examiner and the Board of Studies.

Approaches to assessment are continually reviewed.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Semester</th>
<th>Phase</th>
<th>Course Code</th>
<th>Course Title</th>
<th>SCQF Cr</th>
<th>SCQF Lvl</th>
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<tbody>
<tr>
<td>1</td>
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<td>F11MT</td>
<td>Modelling and Tools</td>
<td>15</td>
<td>11</td>
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<tr>
<td>1</td>
<td>2</td>
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<td>F11ND</td>
<td>Numerical Analysis (PDEs)</td>
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<tr>
<td>1</td>
<td>2</td>
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<td>F11SS</td>
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<tr>
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<td>3</td>
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<td>F11GM</td>
<td>Masters Project and Dissertation</td>
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<table>
<thead>
<tr>
<th>Stage</th>
<th>Semester</th>
<th>Phase</th>
<th>Course Code</th>
<th>Course Title</th>
<th>SCQF Cr</th>
<th>SCQF Lvl</th>
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<td>15</td>
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<td>F11NS</td>
<td>Modelling and Simulation in the Life Sciences</td>
<td>15</td>
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<td>F11NC</td>
<td>Numerical ODEs</td>
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<tr>
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<td>Statistical Methods</td>
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<td>F11AL</td>
<td>Applied Linear Algebra</td>
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<td>11</td>
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<td>1</td>
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<td></td>
<td>F11AN</td>
<td>Mathematical Biology and Medicine</td>
<td>15</td>
<td>11</td>
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<tr>
<td>1</td>
<td>2</td>
<td></td>
<td>F11DA</td>
<td>Data Assimilation with Applications to Climate Change</td>
<td>15</td>
<td>11</td>
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<tr>
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<td>F11MP</td>
<td>Partial Differential Equations</td>
<td>15</td>
<td>11</td>
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<tr>
<td></td>
<td>1</td>
<td></td>
<td>F79BI</td>
<td>Bayesian Inference &amp; Computational Methods</td>
<td>15</td>
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</table>

**COMPOSITION NOTES (PG)**

Some choices of courses may not be available to students in some years because of timetabling constraints.

- Mandatory Credits: 45
- Optional Credits: 75
- Elective Credits: 0
- Dissertation Credits: 60
- Total: 180

**AWARDS, CREDITS AND CRITERIA (PG)**

<table>
<thead>
<tr>
<th>Awards, Credits and Levels</th>
<th>Overall Credits</th>
<th>Specific Requirements</th>
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<tbody>
<tr>
<td>Masters Degree</td>
<td>180</td>
<td>180 SCQF credits including a minimum of 150 credit at Level 11</td>
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</table>
F1CM-COM Master of Science in Computational Mathematics

<table>
<thead>
<tr>
<th>Award Requirements</th>
<th>Total Course Passes</th>
<th>Overall Mark</th>
<th>Overall Grade</th>
<th>Basis of Overall Mark/Grade</th>
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<tbody>
<tr>
<td>Master (Distinction)</td>
<td>8+Dissertation</td>
<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C plus a Dissertation at grade A.</td>
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<tr>
<td>Master</td>
<td>8+Dissertation</td>
<td>50</td>
<td>C</td>
<td>Credit Weighted Average greater than or equal 50% over 8 courses at grades A-D plus a Dissertation at minimum grade C.</td>
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<tr>
<td>Diploma (Distinction)</td>
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<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C</td>
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<tr>
<td>Diploma</td>
<td>8</td>
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<td>Credit Weighted Average greater than or equal 40% over 8 courses at grades A-E</td>
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<tr>
<td>Certificate</td>
<td>4</td>
<td>40</td>
<td>D</td>
<td>Credit Weighted Average greater than or equal 40% over 4 courses at grades A-E</td>
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**DURATION OF STUDY**

<table>
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<tr>
<th>IN MONTHS</th>
<th>Full-time</th>
<th>Part-time</th>
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<tbody>
<tr>
<td>Masters</td>
<td>12</td>
<td>24</td>
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<tr>
<td>Diploma</td>
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<td>15</td>
</tr>
<tr>
<td>Certificate</td>
<td>6</td>
<td>12</td>
</tr>
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</table>

**RE-ASSESSMENT (PG)**

1. A student who has been awarded a Grade E or F in a course may be re-assessed in that course. A student who has been awarded a Grade D in a course may be re-assessed in that course in order to proceed to or be eligible to receive the award of Masters.
2. A student shall be permitted only one re-assessment opportunity in a maximum of three taught courses. The opportunity for re-assessment in four or more taught courses shall be at the discretion of the Progression Board.
3. Any further re-assessment opportunities in a course will require the approval of the Postgraduate Studies Committee.
4. A student may be permitted, at the discretion of the Progression Board, to be re-assessed in the dissertation, project or other supervised research component of the course of study.

**PROGRESSION TO DISSERTATION/PROJECT**

The majority of courses at grade C or above and no course pass at less than grade D.