### Programme Codes
F157-APM/F155-APM /F150-APM

### Programme Title
Applied Mathematical Sciences with Biological and Ecological Modelling

### School/Institute
Mathematical & Computer Sciences

### Type
MSc, PG Diploma, PG Certificate

### Program Accredited by
Mathematics

### QAA Subject Benchmarking Group(s)
Mathematics

### Date of Production/Revision
April 2014/201415

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### Mandatory and Optional Courses

<table>
<thead>
<tr>
<th>Course Code &amp; Title</th>
<th>Effort Hours</th>
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<th>Course Code &amp; Title</th>
<th>Effort Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory Courses:</strong></td>
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<tr>
<td>F11AM Mathematical Ecology</td>
<td>150</td>
<td>F11AN Mathematical Biology and Medicine</td>
<td>150</td>
<td>MSc Only : F11GM MSc Dissertation</td>
<td>600</td>
</tr>
<tr>
<td>F11MT Modelling and Tools</td>
<td>150</td>
<td>F11AS Dynamical Systems</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional Courses:</strong> 2 from</td>
<td></td>
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<td></td>
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<tr>
<td>F11AP Approximation of Continuous Systems</td>
<td>150</td>
<td>F11ND Numerical Analysis of PDEs</td>
<td>150</td>
<td></td>
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</tr>
<tr>
<td>F11MM Optimisation</td>
<td>150</td>
<td>F11AF Applied Mathematics F</td>
<td>150</td>
<td></td>
<td></td>
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<tr>
<td>F11NC Numerical Analysis of ODEs</td>
<td>150</td>
<td>F11MP Partial Differential Equations</td>
<td>150</td>
<td></td>
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</tr>
<tr>
<td>F11AE Applied Mathematics E</td>
<td>150</td>
<td>A11AM Climate Change: Mitigation and Adaptation Measures</td>
<td></td>
<td></td>
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<tr>
<td>F11SU Statistical Methods</td>
<td>150</td>
<td>F79BI Bayesian Inference and Computational methods</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A11CC Climate Change Causes and Impacts</td>
<td>150</td>
<td>F11SS Special Topics</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Or other suitable course(s) at the level 11</td>
<td></td>
<td>Or other suitable course(s) at the level 11</td>
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</tbody>
</table>

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### Arrangement of Courses

- Mandatory Courses: 8 courses (4 mandatory & 4 optional) plus a project/dissertation for MSc.
- Optional Courses: Any 2 from

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### Awards, Credits & Level
- 180 SCQF credits for MSc; incl at least 150 credits at Level 11
- 120 SCQF credits for PG Dip; incl at least 90 credits at Level 11
- 60 SCQF credits for PG Cert; incl at least 40 credits at Level 11
## Programme Notes

### 1. Nominal Pass Mark/Grade
- Masters: C
- Diploma: D
- Certificate: D

### 2. Summary of Assessment Methods
Assessment methods across the programme are set to provide an appropriate balance of exams and coursework
- % coursework: Variable according to course choice. Details can be found on relevant course descriptors
- % examination: Variable according to course choice. Details can be found on relevant course descriptors

### 3. Re-assessment Opportunities
There will be a single resit at the next opportunity.
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4. Award Criteria

<table>
<thead>
<tr>
<th>Number of Course Passes</th>
<th>Overall Mark/Grade</th>
<th>Basis of Overall Mark/Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Master (Distinction):</strong></td>
<td>8+ Dissertation</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Master:</strong></td>
<td>8+ Dissertation</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Diploma (Distinction):</strong></td>
<td>8</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Diploma:</strong></td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Certificate:</strong></td>
<td>4</td>
<td>40%</td>
</tr>
</tbody>
</table>

5. Course Choice/Dissertation

Students will normally take the mandatory courses and in particular the two mathematical biology courses. The dissertation will be in the field of mathematical modelling in the biosciences and must be approved by the programme leader or programme director.

An optional course may not run if there is insufficient demand for it. Some choices of courses may not be available to students in some years because of timetabling constraints.
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<td>Mathematical &amp; Computer Sciences</td>
<td></td>
<td></td>
<td>None</td>
<td>Mathematics</td>
<td>April 2014/201415</td>
</tr>
</tbody>
</table>

6. Additional Information

None

The accompanying Programme Description provides details of aims, outcomes, teaching & learning and assessment policies for the programme. Details of individual courses are provided in the appropriate Course Descriptors.

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10. 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 mathematical biology and ecology
- Cultivate skills in key areas of computational, applied mathematics and statistics
- Develop original and creative solutions to problems in the 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 biology and ecology.

11. The Programme provides opportunities for learners to achieve the following outcomes:

### Understanding, Knowledge and Cognitive Skills

- Extensive detail and critical understanding of the core areas and issues in mathematical sciences and mathematical biosciences
- Crucial comprehension of central topics in computational mathematics, statistics and areas of mathematics biology and ecology

### Scholarship, Enquiry and Research

- Expertise in range of techniques in applied and computational mathematics and statistics with applications in the biosciences
- Extensive skills in use of computers to solve problems in mathematics and statistics with application to the biosciences

### Industrial, Commercial and Professional Practice

- Develop critical awareness of current practices within the applied mathematical sciences and its applications in biology and ecology.
- 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 and ICT

- Develop and demonstrate skills in writing and giving presentations
- Develop and demonstrate skills in computer environments to present and communicate and problem solve
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NA

7. UCAS Code  
NA

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9. Date of Production/Revision  
October 2007

10. 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 courses 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.

11. 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 module 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 module.

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

Approaches to assessment are continually reviewed.

The accompanying Programme Structure template provides details of courses, awards and credits for the programme.

The accompanying Programme Notes provide details of stage notes, progression requirements and award requirements for the programme.