1. Programme Title(s):
MSc/PGDip*/PGCert* Financial Mathematics and Computation
*Only available as an exit award

2. Awarding body or institution:
University of Leicester

3. a) Mode of study
Full-time
b) Type of study
Campus-Based

4. Registration periods:
The normal period of registration is 12 months
The maximum period of registration is 24 months

5. Typical entry requirements:
The entry requirements are at least a 2.1 class honours BSc degree or qualification of equivalent standard recognised by the University in physics, engineering or mathematics. In general, it is expected that a student has a solid background in mathematics (calculus, linear algebra, ordinary differential equations, basics of probability and statistics). Because applications are treated on an individual basis, alternative qualifications, including work experience, may be considered.

Students’ whose first language is not English will need to satisfy the University’s English language requirements, equivalent to IELTS 6.0.

6. Accreditation of Prior Learning:
N/A

7. Programme aims:
Students on this course are expected to acquire knowledge and understanding of Financial Mathematics and computational techniques for finance that will equip them to enter competitively the pool of potential employees of investment banks and other financial institutions. By the end of the course, students should be able to formulate problems from finance in mathematical terms, select and develop an appropriate numerical method, write a computer program to numerically approximate the problem, and present and interpret these results for a potential client. A wide range of career opportunities is available to graduates in Financial Mathematics: commercial and investment banks, brokerage and investment firms, insurance companies, consulting and accounting firms, treasury departments of nonfinancial corporations, public institutions, such as state and local governments and international organizations, software and technology vendors providing products and services to the financial industry.

8. Reference points used to inform the programme specification:
- QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland
- QAA Master’s Degree Characteristics
- QAA Benchmarking Statement; Mathematics, Statistics and Operational Research (MMath)
• University Learning Strategy
• University Employability Strategy
• Graduate Survey (2014)
• First Destination Survey
• External Examiner’s Reports
### 9. Programme Outcomes:

<table>
<thead>
<tr>
<th>Intended Learning Outcomes</th>
<th>Teaching and Learning Methods</th>
<th>How Demonstrated?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
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</tr>
<tr>
<td>Advanced knowledge of a range of mathematical topics in financial mathematics and scientific computing. Integration of knowledge across subjects.</td>
<td>Independent research and lectures.</td>
<td>Examinations, coursework, oral presentations, computer demos, project plan, and dissertation.</td>
</tr>
<tr>
<td><strong>Concepts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computational and Mathematical modelling, mathematical abstraction, generalisation, justification, and precision.</td>
<td>Lectures, computer practicals, coursework assignments.</td>
<td>Examinations, coursework, oral presentations, computer demos, project plan, and dissertation.</td>
</tr>
<tr>
<td><strong>Techniques</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming of mathematical algorithms, mastery of research methods, project planning</td>
<td>Lectures, computer labs.</td>
<td>Oral presentations, computer demos, project plan, and dissertation.</td>
</tr>
<tr>
<td><strong>Critical analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to apply understanding of concepts and techniques with independence, rigour &amp; self-reflexivity.</td>
<td>Independent research, lectures, coursework in modules.</td>
<td>Oral presentations, participation in group discussions, essays/demos, project plan, and dissertation.</td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
<td></td>
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</tr>
<tr>
<td>Ability to organise research material and or technology demonstration in a manner appropriate to the medium that is to be assessed; to distinguish between relevant and non-relevant material; to write-up and deliver oral reports on findings to a professional standard; to engage in scientific discussion with peers.</td>
<td>Supervision for project</td>
<td>Oral presentations, Computer demos, project plan, and dissertation.</td>
</tr>
<tr>
<td>Intended Learning Outcomes</td>
<td>Teaching and Learning Methods (b) Transferable skills</td>
<td>How Demonstrated?</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Appraisal of evidence</td>
<td>Lectures, project supervision.</td>
<td>Oral presentations, project plan, and dissertation.</td>
</tr>
<tr>
<td>Research skills</td>
<td>Through progressive modes of assessment, to the project plan, culminating in the dissertation.</td>
<td>Oral presentations, demos, Project plan, and dissertation.</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Presentations during taught modules. Lectures.</td>
<td>Oral presentations, demos, project plan, and dissertation.</td>
</tr>
<tr>
<td>Data presentation</td>
<td>Presentations during taught modules.</td>
<td>Oral presentations, demos, and dissertation.</td>
</tr>
<tr>
<td>Information technology</td>
<td>Various Computing modules, computing assignments in other taught modules.</td>
<td>Computer practicals.</td>
</tr>
<tr>
<td>Problem solving</td>
<td>Practical sessions. Tutorials. Project. Coursework. Project (MSc only).</td>
<td>Written examinations, assessed coursework, project. Assessed coursework, project.</td>
</tr>
<tr>
<td>Working relationships</td>
<td>Project supervision, lectures.</td>
<td>Dissertation.</td>
</tr>
<tr>
<td>Managing learning</td>
<td>Coursework in modules.</td>
<td>Oral presentations, completion of coursework, project plan, and dissertation.</td>
</tr>
</tbody>
</table>
### Intended Learning Outcomes
- Scientific discussion.
- Organisation. Time management.
- Careers and business awareness.

### Teaching and Learning Methods
- Practical sessions. Tutorials. Project (MSc only).
- Structured support decreasing through year. Project (MSc only).
- Careers workshops. Industry-led project. Guest speakers.

### How Demonstrated?
- Project.
- Meeting deadlines.
- Destination data. Student feedback.

### 10. Special features:
N/A

### 11. Indications of programme quality:
External examiners reports.

### 12. Scheme of Assessment
This programme follows the regulations governing taught postgraduate programmes as published in Senate Regulation 6. This programme follows the 120 taught credits and a 60 credit research project structure.

### 13. Progression points
At the end of taught modules (120 credits) student progression will be reviewed. Students satisfactorily completing all taught modules at first attempt will be eligible to proceed to the research project. Those students who have not successfully passed all taught modules will be required to re-sit failed modules in line with the University Senate Regulation 6.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course and a recommendation will be made to the Board of Examiners for an intermediate award where appropriate.

### 14. Rules relating to re-sits or re-submissions:
Students will be allowed one re-sit of the examination component of each module up to the maximum number of permitted re-sits, in line with the University Senate Regulation 6. The number of modules where re-sits are allowed will be capped at half of the taught modules. The mark obtained for re-sit will be capped at 50%. See Senate Regulation 6.

### 15. Additional information [e.g. timetable for admissions]
There will be one intake a year in October and applications are accepted throughout the year. The department has a small number of academic scholarships for students expecting first class degrees, applications are assessed at the point of receipt, and no additional application is required to be considered for a scholarship.

Modules are also taught by the departments of Economics and Computer Science.

Former University of Leicester undergraduate students who have taken the equivalent module as part of their undergraduate studies will not be permitted to sit the same module again. An alternative module will be agreed with them on an individual basis.
16. **External Examiners**
The details of the External Examiner(s) for this programme and the most recent External Examiners’ reports can be found [here](#).

**Appendix 1: Programme structure** (programme regulations)
See below.

All programmes to formally include range of non-credit bearing attendance only activities for careers, student support etc.:  

**Appendix 2: Module Specifications**
See module specification database [http://www.le.ac.uk/sas/courses/documentation](http://www.le.ac.uk/sas/courses/documentation)
# MSc/PGDip in Financial Mathematics and Computation

## SEMESTER 1

<table>
<thead>
<tr>
<th>Core Modules</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA7071 FINANCIAL MATHEMATICS I</td>
<td>15</td>
</tr>
<tr>
<td>MA7012 SCIENTIFIC COMPUTING</td>
<td>15</td>
</tr>
<tr>
<td>CO7105* ADVANCED C++ PROGRAMMING</td>
<td>15</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>PA7081* PRACTICAL PROGRAMMING</td>
<td>15</td>
</tr>
</tbody>
</table>

*One of these modules must be taken*

### Optional Modules

One selected from:

- MA7077 OPERATIONAL RESEARCH                     | 15      |
- MA7404 MARKOV PROCESSES                        | 15      |

**15**

- MA7403 STATISTICAL DISTRIBUTIONS AND INFERENCE | 15      |
- MA7023 BUSINESS STATISTICS                     | 15      |
- MN7022 FOUNDATIONS OF FINANCIAL ANALYSIS AND INVESTMENT | 15 |

**Semester Total**  **60**

## SEMESTER 2

<table>
<thead>
<tr>
<th>Core Modules</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA7072 FINANCIAL MATHEMATICS II</td>
<td>15</td>
</tr>
<tr>
<td>MA7011 COMPUTATIONAL PARTIAL DIFFERENTIAL EQUATIONS WITH APPLICATIONS</td>
<td>15</td>
</tr>
<tr>
<td>MA7073 FINANCIAL RISK</td>
<td>15</td>
</tr>
</tbody>
</table>

### Optional Modules

One selected from:

- MA7022 DATA MINING AND NEURAL NETWORKS                | 15      |

**15**

- MA7206 STATISTICAL DATA ANALYSIS                      | 15      |
- MA7021 GENERALIZED LINEAR MODELS                      | 15      |
- MA7414 SURVIVAL MODELS                                | 15      |
- EC7075 INTERNATIONAL MONEY AND FINANCE                | 15      |
- EC7104 FINANCIAL MARKET MICROSTRUCTURE & TRADING      | 15      |
- EC7097 FINANCIAL RISK MANAGEMENT                       | 15      |

**Semester Total**  **60**

## SUMMER

<table>
<thead>
<tr>
<th>Core Modules</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA7002 INDIVIDUAL PROJECT</td>
<td>60</td>
</tr>
</tbody>
</table>

**Total Credits**  **180**