BSc Mathematics with Finance and Investment Banking   UCAS code: G1N3
For students entering Part 1 in 2012/3

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Mathematics, Statistics and Operational Research
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	25/Jul/2014
Programme Director:	Dr Karen Ayres
Programme Advisor:	Dr Karen Ayres
	Dr Carol Padgett
Board of Studies:	School of Mathematical and Physical Sciences
Undergraduate	
Accreditation:	
Optional placement variation(s):	with Placement Experience

Summary of programme aims
The BSc programme in Mathematics with Finance and Investment Banking aims to provide a thorough degree-level education in Mathematics, along with topics from Finance which will help to prepare the graduate for a career in the financial markets. In addition, it aims to provide a range of appropriate subject-specific and transferable skills.

Transferable skills
During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), interpersonal skills, learning skills, self-management, information handling, numeracy, team-working, use of IT and problem-solving skills and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.
By the end of the programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, using standard and mathematics software), scientific writing, oral presentation, team-working, problem-solving, use of library resources, time-management, and career management and planning.

Programme content
The profile which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the optional modules). Students must choose such additional modules as they wish, in consultation with their programme adviser, to make 120 credits in each Part. The number credits per module and the level of each module are shown after its title.

Part 1 (three terms)
Compulsory modules

Code	Module title	Credits	Level
MA1AN1	Analysis I	20	4
MA1CAL	Calculus and Methods	20	4
MA1VM	Vectors and Matrices	10	4
MA1OD1	Ordinary Differential Equations I	10	4
ST1PD	Probability and Distributions	10	4
ST1SIM	Statistical Inference and Modelling	10	4
IC101	Introductory Securities and Markets	20	4
IC102	Introductory Finance / Trading Simulation I	20	4

Part 2 (three terms)
Compulsory modules

Code	Module title	Credits	Level
MA2AN2	Analysis II	20	5
MA2OD2	Ordinary Differential Equations II	10	5
MA2VC	Vector Calculus	10	5
MA2PD1	Partial Differential Equations I	20	5
MA2NA1	Numerical Analysis 1	10	5
MA2LA	Linear Algebra	10	5
IC202	Financial Modelling / Trading Simulation II / CMS	20	5
IC204	Portfolio Management	20	5

Year abroad/Year away/Additional year (three terms)
Compulsory modules

MA2PY	Industrial Placement Year	120	5

The placement should not normally be shorter than nine months full-time and students will be assessed in the form of an end-of-year project.

Part 3 (three terms)
Compulsory modules

Module	Title	Credits	Level
MA3PR	Part 3 Project	10	6
MA3CA1	Complex Analysis I	10	6
MA3ASP	Applied Stochastic Processes	10	7
IC301	Derivatives Securities / Trading Simulation III	20	6

Optional modules
(i) 50 credits from:

MA3AM1	Asymptotic Methods I	10	7
MA3CA2	Complex Analysis II	10	6
MA3CV	Calculus of Variations	10	6
MA3IBP	Initial and Boundary-Value Problems	10	6
MA3PD2	Partial Differential Equations II	10	6
MA3NA2	Numerical Analysis II	10	6
ST3OR	Operational Research	10	6
ST3MVA	Multivariate Data Analysis	10	6
MA3MTI	Measure Theory and Integration	10	6
MA3PT	Probability Theory	10	7
MA3AGT	Applied Graph Theory	10	6

(ii) 20 credits from:

IC302	Financial Engineering	20	6
IC303	Management of Risk	20	6
IC305	Research Project in Finance	20	6
IC306	Foreign Exchange and Money Markets	20	6
IC310	Topics in Finance	20	6

Progression requirements
To gain a threshold performance at Part 1 and qualify for the CertHE a student shall normally be required to achieve an overall weighted average of 40% over 120 credits taken in Part 1, where all the credits are at 4 level or above, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1 and obtain a weighted average of least 40% in the Part 1 Mathematics (MA*) modules taken together, and at least 40% in the Finance (IC*) modules taken together, with at least 30% in each of those modules.

To gain a threshold performance at Part 2, a student shall normally be required to achieve:
(i) a weighted average of 40% over 120 credits taken at Part 2;
(ii) marks of at least 40% in individual modules amounting to not less than 80 credits; and
(iii) marks of at least 30% in individual modules amounting to not less than 120 credits.
In order to progress from Part 2 to Part 3, a student must achieve a threshold performance

Students are required to pass the professional/placement year in order to progress on the programme which incorporates the professional/placement year. Students who fail the professional/placement year transfer to the non-placement year version of the programme.

Assessment and classification
The University's honours classification scheme is:

Mark	Interpretation
70% - 100%	First class
60% - 69%	Upper Second class
50% - 59%	Lower Second class
40% - 49%	Third class
35% - 39%	Below Honours Standard
0% - 34%	Fail

For the University-wide framework for classification, which includes details of the classification method, please see: www.reading.ac.uk/internal/exams/Policies/exa-class.aspx

The weighting of the Parts/Years in the calculation of the degree classification is

Three-year programmes
Part 2 one-third
Part 3 two-thirds
Teaching is organised in modules that typically involve both lectures and problems. The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks. The pass mark in each module is 40%. Modules in Part 1 and 2 are assessed by a mixture of coursework and formal examination. There are some modules which are assessed wholly by coursework and others wholly by examination; the details are given in the module descriptions.

Admission requirements
Entrants to this programme are normally required to have obtained:
• Grace C or better in English GCSE; and
• UCAS Tariff: A-level 360 points including grade A in A-level Mathematics; or
• International Baccalaureate: 30 points including 6 in Higher Mathematics; or
• Advanced GNVQ: Merit in one of the following subject areas: Engineering, Information Technology or Science, accompanied by A-level Mathematics Grade B; or
• Scottish Highers: Grade A in Mathematics and two Bs and a C in three other subjects; or
• Irish Leaving Certificate: Grade A in Mathematics and three Bs and a C in four other subjects.

Admissions Tutor: Dr Steve Langdon

Support for students and their learning

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers, Placement and Experience Centre (CPEC), In-sessional English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing, academic issues (eg problems with module selection) and exam related queries. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions and runs workshops and seminars on a range of topics. For more information see www.reading.ac.uk/student

Within the Mathematics and Statistics Department additional support is given though practical classes in Part 1. The development of problem-solving skills is assisted by extensive provision of model solutions to problems. There is a Course Adviser to offer advice on the choice of modules within the programme.

In addition, the ICMA Centre provides three purpose-built dealing rooms that include Reuters and Bloomberg terminals and normal high specification PCs that students use for *INVEST* trading simulations and coursework. The ICMA Centre's Continuing Professional Development Unit provides specialised careers advice targeting the investment banking industry.

Career prospects

This programme is new, but destinations for graduates are expected to include accountancy, actuarial work, management services and teaching, and also a variety of careers in the financial services sector, principally in the City of London but also in other international financial centres. Examples include jobs in the various departments of banks and securities firms (trading, sales, back office administration and compliance, risk management, portfolio management, financial engineering, software development).

Opportunities for study abroad or for placements

A version of this programme to include a maxi placement is available. Students undertaking a maxi placement spend a year in industry between the second and third taught year and will be transferred to a 4-year programme. This year does not contribute to the final degree classification.

Although it is ultimately up to the student, the ICMA Centre's Continuing Professional Development Unit provides support for obtaining and internship with city investment banks for the summer following the end of Part 2.

Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

A. Knowledge and understanding of:

1. The fundamental concepts and techniques of calculus, analysis, algebra, dynamics and numerical mathematics
2. The use of the basic techniques of mathematics in applicable areas of mathematics, such as differential equations and numerical analysis
3. The fundamental concepts at the core of financial knowledge comprising microeconomics, macroeconomics, investments and coroporate finance
4. The basic techniques in econometrics comprising OLS estimation, hypothesis testing and module evaluation
5. How to apply financial concepts and techniques

Teaching/learning methods and strategies

The knowledge required for the basic topics is delineated in formal lectures supported by Mathematics problem sets for students to tackle on their own, for which model solutions and tutorials (in Parts 1 and 2) are provided through which students can obtain feedback on their formative work. On the Finance side, practical (including dealing room sessions) and conventional classes, and supervisions supported by direct and assessed self-study.

Assessment

Most knowledge is tested through a combination of coursework and unseen formal examinations.

to solve 'business world' problems

6. A selection of more specialist optional topics

Dissertations and oral presentations also contribute in other parts of the programme.

Skills and other attributes

B. Intellectual skills - *able to:*

1. Think logically
2. Structure, analyse and solve problems
3. Organise tasks into a structured form
4. Transfer appropriate knowledge and methods from one topic within the subject to another

Teaching/learning methods and strategies

Logic is an essential part of the understanding and construction of mathematical proofs and is embedded throughout the programme. The quality of a solution to a problem is substantially determined by the structure of that response; analysis, synthesis, problem solving, integration of theory and application, and knowledge transfer from one topic to another are intrinsic to high-level performance in the programme.

On the Finance side, substantive problems are illustrated in lectures and smaller groups. Essays, project work and problem sets provide related opportunities for problem-solving. Lectures supported by essays and discussions provide the basis of ensuring the growing knowledge base becomes comprehensible.

Assessment
1- 3 are assessed indirectly in most parts of Mathematics, while 4 contributes to the more successful work. Finance courses are assessed through examination questions, essays, project work and problem sets.

C. Practical skills - *able to:*

1. Understand and construct mathematical proofs
2. Formulate and solve mathematical problems
3. 3. Analyse numerical methods and respond to the issues of accuracy and stability
4. Utilise Reuters and Bloomberg business information and analytical tools
5. Use spreadsheet software to analyse complex practical problems in finance
6. Operate in a dealing room environment including the ability to manage the bid / ask spread

Teaching/learning methods and strategies

Mathematical proof is taught in Part 1 lectures and reinforced in practical classes. Problem solving is introduced in lectures in Part 1 and forms a large part of subsequent Mathematics. Numerical analysis courses introduce and develop the ideas of accuracy, stability and convergence, illustrated by practical tasks.
Finance practical skills are introduced in lectures, and are acquired in supporting tutorials, computer sessions and dealing room session, and are reinforced by problem sets and supervised project work.

Assessment
1 and 2 are tested both formatively in coursework and summatively in examinations. 3 is assessed practically through coursework and the principles through formal examination. 4-6 are assessed through simulated dealing room sessions, computer sessions and tutorials.

D. Transferable skills - *able to:*

1. Use IT (word-processing, using standard and mathematical software, data exchange, graphics, Excel, econometric software and

Teaching/learning methods and strategies

The use of IT is embedded throughout the computational side of the Mathematics modules, and an integral part of the practical side of the Finance

directed Website searches)
2. Communicate scientific ideas
3. Communicate orally (including through oral presentations) and in writing
4. Work as part of a team
5. Use library and web-based resources
6. Manage time
7. Career planning

modules. Team work and career planning are part of one Part 2 module. Oral communication skills are assessed at several points in the programme, and written communication skills are assessed through each piece of written submitted coursework. Oral communication, presentation and team-working skills are specifically emphasised in the CMS module taught in the second year. Good time management is essential for the timely completion of the programme. Use of library and web-based resources contribute to the best performances throughout.

Assessment

1 and 2 are assessed through coursework. 3-5 contribute towards assessed coursework in projects, problem sets and dealing room sessions. 6 is not directly assessed, but effective time management will contribute to the best performances throughout. 7 is assessed in the CMS module taught in the second year.

Please note - This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.