BSc Mathematics and Economics   **UCAS code: GL11**
For students entering Part 1 in 2015/6

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Mathematics, Statistics and Operational Research; Economics
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	20/Aug/2015
Programme Director:	Dr Peter Chamberlain
Programme Advisor:	Dr Peter Chamberlain
	Dr James Reade
Board of Studies:	School of Mathematical and Physical Sciences
Undergraduate Accreditation:	
Optional placement variation(s):	with Year Abroad/with Placement Experience

Summary of programme aims
The course aims to impart a broadly based training in both subjects, a good preparation for work in quantitative economics and competence to use mathematical methods to create and study models of economic behaviour. 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 communication (both written and oral), information handling, numeracy, team working, use of IT and problem-solving 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 mathematics, econometric and standard 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.

Part 1 (three terms)
Compulsory modules

Code	Title	Credits	Level
EC113	Introductory Microeconomics	20	4
EC114	Introductory Macroeconomics	20	4
EC115	Introductory Quantitative Methods in Economics and Business 1	10	4
EC116	Introductory Mathematics for Economics 1	10	4
MA1CA	Calculus	20	4
MA1FM	Foundations of Mathematics	20	4
MA1LA	Linear Algebra	20	4

Part 2 (three terms)
Compulsory modules

Code	Module title	Credits	Level
MA2RA1	Real Analysis I	20	5
MA2ODE	Ordinary Differential Equations	10	5

MA2PDE	Partial Differential Equations I	10	5
MA2NA1	Numerical Analysis I	10	5
MA2GS	General Skills	10	5
EC201	Intermediate Microeconomics	20	5
EC202	Intermediate Macroeconomics	20	5

Students must also take one of the following Economics modules (total 20 credits):

Either

EC204	Introductory Econometrics	20	5

Or

EC221	Economic Theory	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.

MA2SA	Study Abroad Year	120	5

The study abroad year should not normally be shorter than nine months full time.

Part 3 (three terms)
Compulsory modules

Code	Module title	Credits	Level
MA3RCA	Real and Complex Analysis	20	6
MA3VC	Vector Calculus Advanced	10	6
EC301	Microeconomics Advanced	20	6
EC302	Macroeconomics	20	6

Optional Modules
Choose one of the options below.
EITHER
Option 1

EC3DIS	Dissertation	20	6

and 30 credits from:

MA3WW	Water Waves	10	6
MA3DS	Dynamical Systems	10	6
MA3NAT	Numerical Analysis II	20	6
MA3ASP	Applied Stochastic Processes	10	7
MA3MB	Mathematical Biology	10	6
MA3CV	Calculus of Variations	10	6
ST3MVA	Multivariate Data Analysis	10	6
MA3PD2	Partial Differential Equations II	10	6
MA3CEC	Cryptography and Error Correcting Codes	10	6

OR
Option 2

MA3PR	Part 3 Project	10	6

(i) and 20 credits chosen from:

MA3WW	Water Waves	10	6
MA3DS	Dynamical Systems	10	6
MA3NAT	Numerical Analysis II	20	6

MA3ASP	Applied Stochastic Processes	10	7
MA3MB	Mathematical Biology	10	6
MA3CV	Calculus of Variations	10	6
ST3MVA	Multivariate Data Analysis	10	6
MA3PD2	Partial Differential Equations II	10	6
MA3CEC	Cryptography and Error Correcting Codes	10	6

(ii) and 20 credits chosen from the following list. Not all optional modules will necessarily be available in any year.

EC303	Applied Econometrics	20	6
EC311	International Econometrics	20	6
EC313	Business & Financial Forecasting	20	6
EC314	Public Economics	20	6
EC315	History of Economic Thought	20	6
EC316	European Economic Integration	20	6
EC318	Econometric Methods	20	6
EC320	Money & Banking	20	6
EC324	European Urban & Regional Economics	20	6
EC328	Economics of Land, Development & Planning	20	6
EC337	Processes of Long Term Political & Economic Change	20	6
EC339	Microeconomics for Developing Countries	20	6
EC342	Macroeconomics for Developing Countries	20	6
EC344	Banking in Emerging Economies	20	6
EC347	Industrial Organisation	20	6
EC348	Business History	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 at least 40% over the modules MA1CA, MA1LA and MA1FM and obtain a weighted average of at least 40% over the modules EC113, EC114, EC115 and EC116 with no more than 20 credits of Economics modules with a mark below 40%, and obtain marks of at least 30% in 120 credits.

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.

Summary of Teaching and Assessment
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: http://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
Four-year programmes, including placement year: Normally:
Part 2 one-third
Placement Year not included in classification
Part 3 two-thirds
(where students fail a placement year which does not contribute to classification they transfer to the three-year version of the programme)
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, either wholly by coursework, wholly by examination or by a combination of examination and coursework; the details are given in the module descriptions.

Admission requirements
Entrants to this programme are normally required to have obtained:
UCAS Tariff: A-level: ABB including grade A in A-level Mathematics;
International Baccalaureat: 30 points including 6 in Higher Mathematics.
Equivalent qualifications are acceptable.

Admissions Tutor: Dr Calvin Smith

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 through practical classes in Part 1. The development of problem-solving skills is assisted by provision of model solutions to problems. The Department of Economics provides class support for all its modules. These are used to discuss problem sets and other forms of specific work that students complete prior to meetings. There is a Programme Adviser to offer advice on the choice of modules within the programme.

Career learning

Career prospects
In recent years, students who have followed this programme have gone into jobs as actuarial trainee, trainee chartered accountant, teaching, business analyst and postgraduate study.

Opportunities for study abroad
As part of the degree programme students have the opportunity to study abroad at an institution with which the University has a valid agreement. This year does not contribute to the final degree classification.

Placement opportunities
A version of this programme which includes a maxi placement is available (BSc Mathematics and Economics with a Placement Year).

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 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 economic knowledge, comprising microeconomics, macroeconomics and quantitative economics
4. Some central techniques in econometrics comprising model specification, estimation, hypothesis testing and evaluation
5. A selection of more specialist optional topics

Teaching/learning methods and strategies

The knowledge required for the basic topics is delineated in formal lectures, practical (including computer) and conventional classes, and supervisions supported by directed and assessed self-study. Feedback and guidance are an important part of the process for all three years of study. In the later parts of the course students are expected to work at additional problems on their own and seek help when required.

Assessment
Most knowledge is tested through a combination of coursework and unseen formal examinations. Essays also contribute in other parts of the programme.

Skills and other attributes

B. Intellectual skills - *able to:*

1. Think logically
2. 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
5. Comprehend the evolving state of knowledge in the degree subject areas

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 economics 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 the programme, while 4 contributes to the more successful work. Assessment in economics is through examination questions, essays, project work and problem sets.

C. Practical skills - *able to:*

1. Understand and construct mathematical proofs

Teaching/learning methods and strategies

Mathematical proof is taught in Part 1 lectures and

2. Formulate and solve mathematical problems
3. Analyse numerical methods and respond to the issues of accuracy and stability
4. Use econometric software to analyse complex practical problems

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 and stability, illustrated by practical tasks.

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 is practised via applied econometric exercises.

D. Transferable skills - *able to:*

1. Use IT (word processing, using standard data exchange, graphics, econometric and mathematical software)
2. Communicate scientific ideas
3. Give oral presentations
4. Work effectively as part of a team
5. Use library resources
6. Manage time
7. Plan their career

Teaching/learning methods and strategies

The use of IT is an integral part of the practical side of the economics component. It is encouraged through applications requiring economic and econometric analysis. Team work and career planning are part of the module General Skills. Time management is essential for the timely and effective completion of the programme. Use of Library resources contributes to the best performance throughout the programme.

Assessment
Skills 1 and 2 are assessed through coursework. Skills 2 - 5 and 7 contribute assessed coursework towards the module General Skills. Effective use of all of these skills will enhance performance in later modules.

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.