

**PROGRAMME SPECIFICATION**

<b>1</b>	<b>Awarding Institution</b>	Newcastle University
<b>2</b>	<b>Teaching Institution</b>	Newcastle University
<b>3</b>	<b>Final Award</b>	BSc (Hons)
<b>4</b>	<b>Programme Title</b>	GN13 Financial Mathematics GN1X Financial Mathematics with Industrial Placement
<b>5</b>	<b>UCAS/Programme Code</b>	See 4.
<b>6</b>	<b>Programme Accreditation</b>	None
<b>7</b>	<b>QAA Subject Benchmark(s)</b>	Mathematics, Statistics and Operational Research; Accounting
<b>8</b>	<b>FHEQ Level</b>	6
<b>9</b>	<b>Date written/revised</b>	April 2014

**10 Programme Aims**

- 1 To provide an integrated degree structure which gives a modern introduction to financial mathematics and accounting.
- 2 To produce graduates who have a sound, broad knowledge of the fundamental aspects of mathematics and statistics, complemented by knowledge of specialist areas, and an awareness of applications of these subjects.
- 3 The programme allows students to develop the ability to reason logically and their capacity for mathematical and statistical thinking, and to equip students with a range of subject-related key skills.
- 4 To provide the fundamental knowledge required to tackle practical problems in financial mathematics.
- 5 To provide an understanding of model assumptions and when they are violated.
- 6 To equip students with the knowledge and skills to apply mathematics and statistics in the business world.
- 7 To equip students with the knowledge and skills required to work in banking and finance or areas within management which require good quantitative skills.
- 8 To provide a sound grounding in the conceptual and applied aspects of finance.
- 9 For those students taking Financial Mathematics with Industrial Placement, to provide students with a period of practical experience and the opportunity to develop their work place skills.

## **11 Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for Mathematics and Statistics and Operational Research, and Accounting.

### **Knowledge and Understanding**

On completing the programme students should have:

- A1. An understanding of fundamental concepts and methods of mathematics and statistics.
- A2. Knowledge and experience of theoretical concepts and analytical techniques in mathematics and statistics.
- A3. The knowledge and experience to tackle practical problems in financial mathematics.
- A4. An understanding of some of the principles of financial reporting and management accounting.
- A5. Knowledge and understanding of chosen specialist areas in financial mathematics.
- A6. Knowledge of the fundamental techniques used in the pricing and hedging of financial instruments.
- A7. The knowledge to apply mathematics and statistics in the business world.
- A8. An understanding of the principal models used in finance and their application to the financial management of multinational corporations.
- A9. An in-depth understanding of international financial management.

### **Teaching and Learning Methods**

Lectures are the principal vehicle for presenting the essential material which defines the module, and provide the key element towards achieving the learning outcomes A1-A9. Problem classes are used to support lecture and enhance students' understanding by providing an opportunity to clarify issues arising from lectures and work through additional examples. In Stage 1, the module MAS1041 includes regular seminars where students present solutions to mathematical problems.

### **Assessment Strategy**

The standard assessment format, used for nearly all modules, is based on an unseen written examination (counting for at least 70% of the assessment), together with an appropriate mixture of course assignments, in-course tests and mini-projects. These methods enable assessment of the Learning Outcomes A1-A9. Assessment by unseen examinations is seen as a valid and reliable method of assessing both ability and knowledge. Details of the specific assessment modes and weightings, for each module, are set out in the module specification in the Degree Programme Handbooks.

In Stages 2 and 3, the MAS modules use a standard format for examination papers in which there is a Section A, consisting of short, straightforward questions which cover the whole module, and a Section B with questions designed to test a greater depth of understanding. In Stage 1, there are a variety of short and medium length questions enabling the students to demonstrate their knowledge of the subject unconstrained by the need to answer complete long questions.

### **Intellectual Skills**

On completing the programme students should be able to:

- B1 Formulate problems.
- B2 Prove results by following a sequence of logical steps.
- B3 Solve problems.
- B4 Present data in an understandable way.
- B5 Interpret data.
- B6 Critically evaluate arguments and evidence.
- B7 Formulate complex financial issues in a quantitative way.

### **Teaching and Learning Methods**

Regular drop-in sessions are used in all stages to give students the opportunity to ask individual questions about exercises and to clarify issues arising from lectures. This helps with learning outcomes B1-B3 in most mathematics modules and with B4 and B5 in most statistics modules. Seminars are used in ACC modules to develop the skills in B6 and B7.

### **Assessment Strategy**

Homework assignments are designed to allow students to test and develop these intellectual skills. The assignments are set on a weekly (20 credit modules) or fortnightly (10 credit modules) basis in Stage 2, 3 and 4. In Stage 1 modules there are normally four coursework assessments per Semester and there is significant use of computer based assessment (CBA). Model solutions to all homework exercises are made available to students when the marked work is returned, sometimes earlier if appropriate. Marked work is returned within two weeks of the submission date. Computer based assignments are used in Stage 1 and, to a lesser extent, in Stage 2 to help the students to develop their problem solving skills (B3). The students are given access to try questions in CBA practice mode and then a fixed period to attempt randomly generated questions in 'exam' mode. Having completed an assignment, they are given their marks and the full solutions. In-course tests are used in some Stage 2 and 3 modules to give students practise in problem solving under exam-like conditions (B3). All three forms of assessment contribute to both formative and summative assessment. In the Business School modules, essays are used to assess the students' understanding (B6).

### **Practical Skills**

On completing the programme students should be able to:

- C1 Use the mathematical programme Maple to solve mathematical problems.
- C2 Use the statistical programme language R to solve various statistical problems.
- C3 Use appropriate software to investigate financial situations.
- C4 Apply their knowledge of financial mathematics to financial problems.

### **Teaching and Learning Methods**

Practical classes, held in a computer teaching laboratory, introduce students to the use of computer packages (Maple and R). At Stage 1, Mathematics modules have classes involving the computer algebra package Maple (C1) and in Statistics modules students learn how to use R for data analysis and simulation studies (C2). In later stages, students are expected to use the computer network, as appropriate, for homework assignments or minor projects. Such work often starts in a practical session and is finished in the student's own time. Appropriate software for finance is introduced in some of the early ACC modules (C3). Various later modules cover solving financial problems (C4).

### **Assessment Strategy**

Computing skills are assessed through mini projects or through questions in homework assignments. (C1-C4)

### **Transferable/Key Skills**

On completing the programme students should be able to:

- D1 Write project reports using Word.
- D2 Demonstrate a high level of numeracy.
- D3 Demonstrate a high level of computer literacy.
- D4. Communicate orally and in written form in English.
- D5 Work in a team.

### **Teaching and Learning Methods**

Students learning is supported by weekly or fortnightly exercises (D2 and D3). Project work is normally started within Practical sessions (D1 and D3). Further support is given in drop-in sessions (D2). Seminars in the Business School modules develop the students' communication skills (D4).

For those students taking Financial Mathematics with Industrial Placement, many of the key skills are likely to feature in the work place. Whilst D2 and D5 would be expected in most placements, the wide variety of possible placements makes it unfeasible to be prescriptive.

## **Assessment Strategy**

Many statistics modules and some mathematical modules have a project element (D1 and D3). Most modules involve exercises which improve numeracy (D2). Most Business School modules involve writing essays (D4) and some involve group work (D5).

## **12 Programme Curriculum, Structure and Features**

### **Basic structure of the programme**

Financial Mathematics lasts three years and comprises 360 credits spread equally over the three stages.

Financial Mathematics with Industrial Placement lasts four years and comprises 360 credits spread equally over three stages together with the placement year. Students are not admitted to a programme with a placement year, but may transfer early in Semester 2 of Stage 2, subject to approval by the Degree Programme Director and normally subject to attaining an average of at least 55 over Stage 1 and Semester 1 of Stage 2.

These major-minor degree programmes combines Mathematics and Statistics applicable to finance with Accounting. To be able to read and understand the literature of financial mathematics a student must have a sound grounding in core mathematical techniques, such as calculus, differential equations, real analysis, linear algebra etc., which are substantial bodies of knowledge and which are covered in the core Stage 1 and 2 modules. At each stage there is at least 40 credits of a specifically financial or accountancy nature over the two Schools. At Stage 3 there are 60 credits of material directly relevant to finance or accountancy.

### **Key features of the programme (including what makes the programme distinctive)**

In each year, students take 120 credits divided between two subject areas as follows:

- 80 credits of modules offered by the School of Mathematics and Statistics (the modules in Financial Mathematics will be compulsory)
- 40 credits of modules offered by the Business School.

This degree scheme introduces students to the application of advanced mathematical and statistical techniques to finance.

Subject to approval, students may transfer to a programme including a placement year between Stages 2 and 3.

## Programme regulations (link to on-line version)

<http://www.ncl.ac.uk/regulations/programme/>

### 13 Criteria for admission

#### *Entry qualifications*

Our standard offer is a grade A in 'A' level Mathematics with an A and B in two other 'A' levels. Corresponding offers are made to applicants taking other combinations of A and AS levels and other forms of UK or overseas exams.

#### *Admissions policy/selection tools*

An academic member of the admissions staff considers each application. Based on the information supplied, the staff member decides whether to offer the applicant a place and if so what the terms of the offer are to be.

#### *Non-standard Entry Requirements*

Mature students and those with non-standard qualifications are interviewed whenever this is practical (by telephone if necessary) before any offer is made.

#### *Additional Requirements*

While 'A' level Further Mathematics is not required, preference is given at confirmation to those who have studied it and who have attained a reasonable grade.

#### *Level of English Language capability*

The School uses the standard University entrance requirement (i.e. an IELTS score of 6.5).

### 14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>

#### *Induction*

During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/tutorials/etc. The International Office offers an additional induction programme for overseas students.

### *Study skills support*

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

### *Academic and Pastoral support*

Each undergraduate and taught postgraduate student will be assigned a personal tutor.\*

A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

\*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

### *Support for students with disabilities*

The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

### *Learning resources*

The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

## **15 Methods for evaluating and improving the quality and standards of teaching and learning**

### *Module reviews*

All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

### *Programme reviews*

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Learning, Teaching and Student Experience Committee.

### *External Examiner reports*

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

### *Student evaluations*

All modules and stages\* are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking students' views on the quality of the learning and teaching. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

\*With the exception of intercalating years and the final stages of undergraduate programmes.

### *Mechanisms for gaining student feedback*

Feedback is channelled via the Student-Staff Committee and the Board of Studies.



### *Faculty and University Review Mechanisms*

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

### *Accreditation reports*

### *Additional mechanisms*

## **16 Regulation of assessment**

### *Pass mark*

The pass mark is 40 (Undergraduate programmes)

### *Course requirements*

Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

### *Weighting of stages*

The marks from Stages 2 and 3 will contribute to the final classification of the degree.

The weighting of marks contributing to the degree for Stages 2 and 3 is 1:2.

### *Common Marking Scheme*

The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

		<b>Modules not used for degree classification</b>
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

*Role of the External Examiner*

An External Examiner, a distinguished member of the subject community, is appointed by Faculty Learning, Teaching and Student Experience Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards of the programme

For those students taking Financial Mathematics with Industrial Placement, the placement year is assessed as pass or fail by the Placement Coordinator, based on a report from the employer that the placement was satisfactorily completed or otherwise Students who fail the placement year will be transferred to the Financial Mathematics programme.

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/>

The School Brochure:

<http://www.ncl.ac.uk/marketing/services/print/publications/ordering/>

Degree Programme and University Regulations:

<http://www.ncl.ac.uk/regulations/docs/>

The Degree Programme Handbook

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

## Annex

### Mapping of Intended Learning Outcomes onto Curriculum/Modules

Module	Type	Intended Learning Outcomes			
		A	B	C	D
ACC1010	Core	4	6		1
ACC1011	Core	4	6		1
MAS1041	Core	1	1,3	1	2
MAS1042	Core	1	1,3	1	2
MAS1141	Core	1	1,3	1	2,3
MAS1142	Core	1	1,3	1	2,3
MAS1241	Core	1	1,2,3	1	2
MAS1242	Core	1	1,2,3	1	2
MAS1341	Core	1	1,3,4,5	2	1,2,3
MAS1342	Core	1	1,3,4,5	2	1,2,3
ACC2000	Compulsory	4,8	6		2,4
ACC2007	Core	8	6		2,4
MAS2103	Compulsory	2	1,3		2
MAS2104	Compulsory	2	1,3		2
MAS2105	Compulsory	2	1,3	1	2
MAS2223	Compulsory	2	2,3		
MAS2224	Compulsory	2	2,3		
MAS2243	Compulsory	1,5	2,3	1	2,3
MAS2304	Compulsory	2	1,2,3	2	2
MAS2316	Compulsory	2	1,2,3		2
ACC3000	Compulsory	4,8	6	3	2,4
ACC3006	Compulsory	8,9	6	3	4
MAS3106		2	1,3		1,2,3
MAS3111	Compulsory	3,5	1,3		2
MAS3119		3	1,3		2
MAS3207		3	2		
MAS3214		3	2		2
MAS3215	Compulsory	3,5,6	2,7		2
MAS3216		2	2,3	1	2
MAS3302		3	1,3,5	2	2
MAS3317		3	1,3,5	2	2
MAS3322	Compulsory	3	1,2,3		2
MAS3323		3	1,2,3,4,5	2	1,2,3
MAS3324	Compulsory	3,5,6,7	1,2,3,7	4	2