PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	Financial Mathematics
5	**UCAS/Programme Code**	GN13
6	**Programme Accreditation**	None
7	**QAA Subject Benchmark(s)**	Mathematics, Statistics and Operational Research; Accounting
8	**FHEQ Level**	Honours
9	**Date written/revised**	October 2008

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 To provide a programme which meets the FHEQ at Honours level and which takes appropriate account of the subject benchmark statements in Mathematics, Statistics and Operational Research and Accounting.

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. An understanding of model assumptions and when they are violated.
A7. Knowledge of the fundamental techniques used in the pricing and hedging of financial instruments.
A8. The knowledge to apply mathematics and statistics in the business world.
A9. An understanding of the principal models used in finance and their application to

the financial management of multinational corporations.

A10. An in-depth understanding of either the concepts and rules of financial reporting or of the principal techniques of management accounting and their application to firms.

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-A10. 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.

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-A10. 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, we use a standard format for examination papers in MAS modules in which there is a compulsory Section A, consisting of short, straightforward questions which cover the whole module, and a Section B, offering a choice of 2 out of 3 questions (10 credit modules), or 3 out of 4 questions (20 credit modules) These are longer questions and are designed to test a greater depth of understanding. Our external examiners have commented favourably on the merits of this structure. In Stage 1, MAS modules use 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 weekly (20 credit modules) or fortnightly (10 credit modules) basis in Stage 2, 3 and 4. In Stage 1, there are only two major assessments per Semester as greater use is made 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).

Assessment Strategy

Most 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

This major-minor degree programme 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 70 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 from an approved list of modules offered by the Business School.

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

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

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 the programme offered, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/problem classes, etc. The International Office offers an additional induction programme for overseas students. Revision sessions on key material taught the previous year are provided for returning students.

Study skills support

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Guidance is given on study skills using the booklet "Winning at Mathematics" which is issued to all new students.

Help with academic writing is available from the Writing Centre.

Academic support

The initial point of contact for a student is with a lecturer or module leader, or with their personal tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies. The School organises meetings with students to discuss pre-registration for the following academic year.

Pastoral support

Each student is assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. In addition, the University offers a range of support services, including one-to-one counselling and guidance or group sessions/workshops on a range of topics, such as emotional issues eg. 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 Union Society operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues, etc. The School has a member of the administrative staff designated to give pastoral support as needed.

Support for students with disabilities
The University's Disability Support Service 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. The School has a designated disability support staff member.

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-sessional language training can be provided.

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

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

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

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student 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 the students' views on the quality of the learning and teaching in their HEIs. With reference to the outcomes of the NSS and institutional student satisfaction surveys, actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area receive a review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching and Learning Committee on whether the programmes reviewed should be re-approved for a further five year period. The School of Mathematics and Statistics was reviewed in 2006/7.

Accreditation reports
None

Additional mechanisms
None

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 2:3 for students entering Stage 2 before September 2007 and 1:2 otherwise.

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

		Modules not used for degree classification
<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 Teaching and Learning 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

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

The University Prospectus (see http://www.ncl.ac.uk/undergraduate/ or http://www.ncl.ac.uk/postgraduate/

The School Brochure (contact enquiries@ncl.ac.uk)

The University Regulations (see http://www.ncl.ac.uk/calendar/university.regs/)

The Degree Programme Handbook (see http://www.ncl.ac.uk/math/)

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

		Intended Learning Outcomes			
Module	**Type**	**A**	**B**	**C**	**D**
ACC1001	Core	4	6		1,4
ACC1004	Compulsory	4	3	3	3
ACC1006	Core	4	6		4
MAS1001	Core	1	1,3	1	2
MAS1101	Core	1	1,3	1	2,3
MAS1202	Core	1	1,2,3	1	2
MAS1301	Core	1	1,3,4,5	2	1,2,3
ACC2005		9	6		4
ACC2007	Compulsory	9	6		2,4
ACC2009		9	6		4
MAS2103		2	1,3		2
MAS2104	Compulsory	2	1,3		2
MAS2105	Compulsory	2	1,3	1	2
MAS2201	Compulsory	1,5	2,3	1	2,3
MAS2211	Compulsory	2	2,3		2
MAS2212	Compulsory	2	2,3		2
MAS2213		2	2,3		2
MAS2216		2	2,3	1	2
MAS2302		2	1,3,5	2	2
MAS2303	Compulsory	2	1,2,3		2
MAS2304	Compulsory	2	1,2,3	2	2
ACC3001		10	6		1,4
ACC3006	Compulsory	9,10	6		4
ACC3009		10	6		4
ACC3017		7,8	6,7	4	2,4
MAS3103		3	1,3		2
MAS3106		3	1,3		1,2,3
MAS3111	Compulsory	3,5	1,3		2
MAS3112		3	1,3	1	2,3
MAS3119		3	1,3		2
MAS3207		3	2		
MAS3213		3	2,3		2
MAS3214		3	2	4	2
MAS3215	Compulsory	3,5,7	2		2
MAS3302		3,6	1,3,5	2	2
MAS3305		3,6	1,3,5	2	2
MAS3312	Compulsory	3,5,7,8	1,2,3,7	4	2
MAS3313		3,6	1,2,3,4,5	2	1,2,3