PROGRAMME SPECIFICATION	Newcastle University

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	Mathematics with Finance Mathematics with Finance with Placement Year Mathematics with Business Mathematics with Business with Placement Year Mathematics with Finance with International Study Year Mathematics with Business with International Study Year
5	**UCAS/Programme Code**	G1N3 G1NZ G1N4 1556U 1845U 1844U
6	**Programme Accreditation**	Institute of Mathematics and its Applications
7	**QAA Subject Benchmark(s)**	Mathematics, Statistics and Operational Research; Accounting
8	**FHEQ Level**	6
9	**Date written/revised**	May 2023

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 Mathematics with Finance with Industrial Placement, to provide students with a period of practical experience and the opportunity to develop their work place skills.

For students on the Careers Placement Year programme:

10   Provide students with the experience of seeking and securing a position with an employer.
11   Facilitate independent self-management and proactive interaction in a non-university setting.
12   Provide a period of practical work experience that will benefit current academic study and longer term career plans.

13	Enable students to ethically apply their knowledge and skills in the work place, reflect upon their development and effectively evidence and articulate their learning in relevant future settings.

For students on the International Study Year Programme:

14	Offer students the opportunity to develop graduate attributes which increase employability, particularly communication and (where applicable) language skills, intercultural competencies, adaptability, resilience and global awareness.
15	Gain insight into international Higher Education and experience differences in academic approach and learning environment.
16	Provide the opportunity to experience new areas of study outside of their usual programme of study at Newcastle University.

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.

For students on the Careers Placement Year programme:

A10   Apply personal and professional development strategies to prioritise, plan, and manage their own skills development and learning.
A11   Research, select and apply relevant knowledge aimed at enhancing their own skills and effectiveness in specific duties at their placement.
A12   Demonstrate an understanding of a work environment, how it functions and their contribution to it.
A13   Relate their work based learning to other areas of personal development, including academic performance.

For students on the International Study Year Programme:

A14   Demonstrate the ability to adapt to different learning environments.

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 lectures and enhance students' understanding by providing an opportunity to clarify issues arising from lectures and work through additional examples. In Stage 1, there is a module that 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 assignment, 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 weighting, for each module, are set out in the module specification in the Module Catalogue.

In Stage 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

In-course tests and coursework assignments are designed to allow students to test and develop these intellectual skills. Typically there are three or four assessments in a 10 credit module: a combination of in-course tests, written assignments, mini-project and computer based assessments (CBAs), as appropriate to the module. Stage 1 modules usually have five assessments. Model solutions to all written assignments 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 assessments 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 give students practise in problem solving under exam-like conditions (B3). All forms of in-course 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 Python 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 (R and Python).

These packages will be met in a Stage 2 mathematical computing module for Major/Minor and Joint Honours students. 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 tests and mini projects or through questions in coursework 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   Manage time and prioritise tasks by working to strict deadlines.
D5.   Communicate orally and in written form in English.
D6   Work in a team.

For students on the Careers Placement Year programme:

D7   Reflect on and manage own learning and development within the workplace.
D8   Use existing and new knowledge to enhance personal performance in a workplace environment, evaluate the impact and communicate this process.
D9   Use graduate skills in a professional manner in a workplace environment, evaluate the impact and communicate the personal development that has taken place.

For students on the International Study Year Programme:

D10   Adapt and operate in a different cultural environment.

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). Short presentations in Stage 1 introduce presentations skills (D5). Seminars in the Business School modules develop the students' communication skills (D5).

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 (D5) and some involve group work (D6).

12	Programme Curriculum, Structure and Features

Basic structure of the programme

Mathematics with Finance lasts three years and comprise 360 credits spread equally over the three Stages.

Mathematics with Finance with Industrial Placement last four years and comprise 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.

These Major-Minor degree programmes combine 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 are modules of a specifically financial or accountancy nature over the two Schools (40 credits at Stage 1 and at least 50 credits at Stages 2 and 3).

Student on the Careers Placement Year programme will be on placement year between Stage 2 and 3 of their programme.

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 (a module 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)

[-RMaths Stats MM.pdf (ncl.ac.uk)](#)

13	Support for Student Learning

Generic information regarding University provision is available at the following link.

[Generic Information](#)

14	Methods for evaluating and improving the quality and standards of teaching and learning

Generic information regarding University provision is available at the following link.

[Generic Information](#)

Accreditation reports
None

Additional mechanisms
None

15	Regulation of assessment

Generic information regarding University provision is available at the following link.

[Generic Information](#)

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

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The University Prospectus: http://www.ncl.ac.uk/undergraduate/degrees/#subject

Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/docs/

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.