PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	G1N2 Mathematics with Management G1NY Mathematics with Management (with Industrial Placement)
5	**UCAS/Programme Code**	See 4.
6	**Programme Accreditation**	None
7	**QAA Subject Benchmark(s)**	Mathematics, Statistics and Operational Research
8	**FHEQ Level**	6
9	**Date written/revised**	April 2014

10 Programme Aims

1 To provide an integrated but flexible degree structure, enabling each student to study two-thirds mathematics and statistics, together with the study of the major processes of business management.
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 equip students with the knowledge and skills to apply mathematics and statistics in the business world.
5 To provide a basic understanding of the processes of business management.
6 To provide an understanding of model assumptions and when they are violated.
7 To give a broad understanding of the business world.
8 To provide a sound grounding in some key aspects of management.
9 For those students taking Mathematics with Management (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.

Knowledge and Understanding

On successful completion of the programme students should have:

A1 A broad 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 Further broad knowledge of a number of topics in mathematics and statistics or a more specialist knowledge of particular areas within these subjects, as appropriate to the pathway chosen and as reflected in the degree title awarded.
A4 A broad understanding of fundamental concepts in business management.

A5 More advanced knowledge of enterprise and entrepreneurship.

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-A5. 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. Seminars are used in some of the Business School modules.

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 all enable assessment of the Learning Outcomes A1-A5. 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 successful completion of 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.

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 the ACC and BUS modules to achieve learning outcome B6.

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 Business School modules, seminar diaries and essays are used to assess the students’ understanding (B3 and B6).

Practical Skills

On successful completion of the programme students should be able to:

C1 Use the mathematical programme Maple to solve various mathematical problems.
C2 Use the statistical programming language R to solve various statistical problems.
C3 Analyse business information and operations in order to make management decisions.

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. Analysis of business information skills are developed in seminars (C3).

Assessment Strategy

Computing skills are assessed through mini projects or through questions in homework assignments (C1-C3).

Transferable/Key Skills

On successful completion of 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 Business School modules develop the students' communication skills (D4).
For those students taking Mathematics with Management (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

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

Mathematics with Management (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.

In **Stage 1**, the School aims first to consolidate and reinforce the students' knowledge on entry, and to provide a sound body of introductory material in mathematical methods and in the three subject areas of Applied Mathematics, Pure Mathematics and Statistics. This provides the foundation for subsequent study in these areas. This comprises 80 credits of compulsory material. Also in Stage 1, students are required to study 40 credits of appropriate compulsory modules in Management.

At Stage 2 students take 50 credits of Applied Mathematics and Pure Mathematics modules, 30 credits of Statistics modules and 40 credits of Management modules. All modules are compulsory.

At Stage 3 students take 40 credits of Management modules, and select from a range of modules offered by the school.

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

A distinctive feature of the School's curriculum is the flexible structure, operating within the University's modular system, in which students can choose pathways which provide either:

a) a broad education in mathematics, statistics and management throughout their programme of study, or

b) a general grounding in mathematics, statistics and management followed by more specialised study of chosen areas.

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-sessional 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

		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 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 Mathematics with Management (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 Mathematics with Management 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

		Intended Learning Outcomes			
Module	**Type**	**A**	**B**	**C**	**D**
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
ACC1000	Compulsory	4	1,3,6	3	4
BUS1001	Core	4	6	3	4
ACC2000	Compulsory	4	6	3	4
BUS2000	Compulsory	4	6	3	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		2
MAS2224	Compulsory	2	2,3		2
MAS2302	Compulsory	2	1,3,5	2	2
MAS2304	Compulsory	2	1,2,3	2	2
MAS2316	Compulsory	2	1,2,3		2
ACC3000	Compulsory	4	6	3	4,5
BUS3000	Compulsory	4,5	6	3	4
MAS3106		2	1,3		1,2,3
MAS3111		3	1,3		2
MAS3119		3	1,3		2
MAS3213		2	2		2
MAS3214		3	2		2
MAS3216		2	2,3	1	2
MAS3317		3	1,3,5	2	2
MAS3320		3	1,2,3,4,5	2	1,2,3
MAS3322		3	1,2,3		2
MAS3323		3	1,2,3,4,5	2	1,2,3
MAS3324		3,5	1,2,3		2