UNIVERSITY OF LEICESTER

Pathway Specification (Undergraduate)

Created: 17.09.2015. Last amended: 20 Jan 2017

Pathway specifications are the way that teaching teams integrate the expectations of their subject's benchmarking statement, the University's Learning Strategy, and other indicators of programme quality, with their own expertise and teaching philosophy in order to detail:

- the intended learning outcomes of a specific pathway;
- the teaching and learning methods that enable learners to achieve these outcomes; and
- the assessment methods used to demonstrate their achievement.

1. Pathway Title(s) and UCAS code(s):

Major in Mathematics; UCAS code – G111

2. Awarding body or institution:

University of Leicester

3. a) Mode of study

Full-time

b) Type of study

Campus-based

4. Registration periods:

The normal period of registration is *three years*

The maximum period of registration is *five years*

5. Typical entry requirements:

AAB at A level with A in Mathematics

6. Accreditation of Prior Learning:

No APL accepted

7. Programme aims:

The **Major in Mathematics** aims to

- foster confidence, convey knowledge and develop expertise in mathematics, including an appreciation of the usefulness of mathematics;
- provide an education and training in mathematics which includes fundamental concepts and gives an indication of the breadth of mathematics;
- develop an appreciation of the necessity for rigorous justification of assertions and the need for logical arguments;
- develop the ability to model the world using mathematics, and to be able to produce relevant and robust solutions to real world problems;
- enable students to develop self-confidence gained through the provision of careful guidance in the first level, with increasing independence later;
- improve students' team working skills;
- stimulate intellectual development and develop powers of critical analysis, problem solving, written communication skills and improve presentational skills;
- develop the ability to communicate solutions to problems and mathematical concepts in general using language appropriate to the target audience;
- develop competence in IT, in particular the use of mathematical related programmes;

- enhance practical computing skills by learning software in common use;

8. Reference points used to inform the programme specification:

- QAA subject review [www/qaa.org/].
- Quinquennial Review [www.le.ac.uk/].
- First destinations [www.le.ac.uk/].
- Graduate survey, end of year questionnaire, external examiner reports.
- QAA Framework for Higher Education Qualifications
- QAA Subject Benchmark Statement for mathematics
- University Leicester Learning and Teaching Strategy

9. Programme Outcomes:

Major in Mathematics		
Intended Learning Outcomes	**Teaching and Learning Methods**	**How Demonstrated?**
(a) Discipline specific knowledge and competencies		
(i) Mastery of an appropriate body of knowledge		
Knowledge of basic theory, basic techniques of analysis, algebra, applied mathematics, and statistics. Ability to recognise sound argumentation and valid proofs. Knowledge of basic techniques, and model problems. Knowledge of a computing languages and software.	Lectures, specified reading, problem classes, surgeries, poster presentations. In addition, elements of e-Learning are incorporated. Computer practical classes.	Written examinations, assessed written and computational problems. Assessed oral and poster presentations. Assessed written projects and problem sheets and seminar discussions. Assessed practical classes.
(ii) Understanding and application of key concepts and techniques		
Novel applications of basic knowledge. Exposition of logical structure. Ability to generalise and specialise. Proof techniques. Ability to apply an algorithm for the solution of a standard problem. Ability to apply theorems to solve particular problems. Mathematical modelling. Application of computer algorithms for solving finance problems.	Lectures, tutorials, problem classes, marked assignments. Lectures, tutorials, problem classes, marked assignments. Computer practical classes.	Written examination, assessed problems, project report. Written examinations, assessed problems. Assessed practical classes.
(iii) Critical analysis of key issues		
Analysis of problem and selection of appropriate proof or solution strategy. Critical appraisal of solutions. Analyse and solve more `messily defined' finance management problems. Analysis of IT problems.	Lectures, problem classes, feedback on assessed problems, project supervision.	Written examinations, assessed problems, Project report.
(iv) Clear and concise presentation of material		
Presentation of results (both informal and to a variety of audiences), participation in scientific discussion. Ability to write coherent reports. Software presentation.	Tutorials, Group workshops, Presentation workshops, project supervision. Feedback on assessed written pieces. Guidance from project supervisor.	Group presentations. Project presentations. Assessed essays. Project presentation.

Major in Mathematics		
Intended Learning Outcomes	**Teaching and Learning Methods**	**How Demonstrated?**
(v) Critical appraisal of evidence with appropriate insight		
Project design.	Project supervision	Project reports.
(vi) Other discipline specific competencies		
Knowledge of mathematical software such as MATLAB and MAPLE. Mathematical modelling skills. Language of finance.	Lab classes, and purpose designed handbooks. Group projects. Project and lectures, eLearning.	Log books of practical sessions. Reflective blogs. Use of Maple in basic skills tests. Project reports. Written examinations and presentations.
(b) Transferable skills		
(i) Oral communication		
Response to questioning Scientific communication Project and poster presentation	Tutorials, workshops. Tutorials, workshops. Project supervision, presentation workshops.	Presentation assessment.
(ii) Written communication		
Report writing. Mathematical communication	Project supervisions. Tutorials.	Assessed reports. Assessed questions.
(iii) Information technology		
Use of Windows. Use of specialist packages. Office software.	Induction. Laboratories.	Marked project work. Project reports.
(iv) Numeracy		
Use of analytical and graphical methods	Throughout	Written examinations, project reports.
(v) Team working		
Scientific discussion. Organization, time management	Group problem solving. Group projects.	Group assessment (including peer assessment).
(vi) Problem solving		
Analysis, breakdown, synthesis, critical examination. Mathematical modelling skills.	Lectures, problem workshops, group work, projects.	Marked problems, group work assessment, project assessment
(vii) Information handling		
Conduct background research and literature surveys. Summarise content from information sources. Ability to learn from e-learning resources.	Project supervision. Blackboard stored e-learning resources.	Individual and group project reports. Some assessed material only provided through e-learning resources.

Major in Mathematics		
Intended Learning Outcomes	**Teaching and Learning Methods**	**How Demonstrated?**
(viii) Skills for lifelong learning		
Study skills. Independence and time management. Careers and business awareness. Information retrieval.	Resource based learning. Study skills booklet. Structured support decreasing through years. Guest speakers. Induction library session. Study skills handbook. Project supervision.	Examinations, assessed problems, project assessments. Meeting deadlines.

10. Excluded combinations and course transfers

a) Excluded combinations

Any other variance of Mathematics programme

b) Course transfers

Not applicable for course transfers

11. Criteria for award and classification

As defined in Senate Regulation 5: Regulations governing undergraduate programmes of study.

12. Progression points:

As defined in Senate Regulation 5:

13. Key/extra features:

N/A

14. Indications of programme quality

15. Summary of programme/pathway delivery and assessment:

As per BSc Mathematics degree.

Appendix 1: Programme structure (programme regulations)

MAJOR IN MATHEMATICS

First Year 2017/18

Semester 1

Core modules:

- MA1112 Linear Algebra I (20 credits)
- MA1012 Calculus and Analysis I (10 credits)

Options:

- MA1061 Probability (10 credits)
- MA1253 Mathematics and Society (10 credits)
- MA1104 Elements of Number Theory (10 credits

Semester 2
Core modules:

- MA1113 Linear Algebra II (10 credits)
- MA1013 Calculus and Analysis II (20credits

Options:

- MA1254 Mathematics for Business (10 credits
- MA1202 Introductory Statistics (10 credits
- MA1272 Plane Geometry (10 credits)

Second Year – 2017-18
Semester 1
Core modules:

- MA2132 Linear Algebra III (10 credits)
- MA2032 Calculus and Analysis III (20 credits)

Options:

- MA2104 Elements of Topology (10 credits)
- MA2510 Investigations in Mathematics (10 credits)

Semester 2
Core modules:

- MA2133 Algebra (20 credits)
- MA2022 Differential Equations and Dynamics (10 credits)

Options:

- MA2262 Linear Statistical Models (10 credits)
- MA2511 Business Applications in Mathematics (10 credits)

2018-19
Third Year
Semester 1
Core module:

- MA3518 Mathematics Major Project (10 credits) YEAR LONG

Options (two of the following):

- MA3012 Scientific Computing (20 credits)
- MA3152 Curves and Surfaces (20 credits)
- MA3071 Introduction to Financial Mathematics (20 credits)
- MA3074 Introduction to Actuarial Mathematics (20 credits)
- MA3077 Operational Research (20 credits)

Semester 2
Options (two of the following):

- MA3121 Complex Analysis (20 credits)
- MA3513 Mathematics Business Project (20 credits)
- MA3153 Number Theory (20 credits)
- MA3101 Squaring the Circle and Irreducible Polynomials (20 credits)
- MA3201 Generalised Linear Models (20 credits)
- MA4022 Data Mining and Neural Networks (20 credits)

Appendix 2: Module specifications

See module specification database http://www.le.ac.uk/sas/courses/documentation

Appendix 3: Skills matrix

As BSc in Mathematics.