Programme Specification and Curriculum Map for BSc (Hons) Mathematics

1. Programme title	BSc (Hons) Mathematics
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University
4. Programme accredited by	
5. Final qualification	BSc (Hons)
6. Academic year	2014-2015
7. Language of study	English
8. Mode of study	Full Time / Part Time / Thick Sandwich

9. Criteria for admission to the programme

Admission to the BSc (Hons) Mathematics programmes will require 280 UCAS tariff points normally including a grade B in A-level Mathematics.

In addition Middlesex University general entry requirements apply as outlined in the university's regulation B2. Applicants whose first language is not English are required to achieve 6.0 in IELTS overall (with a minimum of 5.5 in each component) or an equivalent qualification recognised by Middlesex University. The equivalence of qualifications from outside UK will be determined according to NARIC guidelines.

10. Aims of the programme

The programme aims to

- provide a broad and comprehensive knowledge of core areas of pure and applied mathematics in a supportive teaching environment;
- stimulate an interest in all aspects of modern mathematics;
- prepare students for work as professional mathematicians either in academia or elsewhere;

- foster skills including problem solving, communication, team work and the ability to work individually on complex problems;
- develop an appreciation of the importance of mathematics research.

11. Programme outcomes

A. Knowledge and understanding On completion of this programme the successful student will have knowledge and understanding of: 1. core areas of pure mathematics including geometry, algebra, mathematical analysis and discrete mathematics; 2. core areas of applied mathematics including statistics, operational research and differential equations; 3. several specialised areas of advanced mathematics and its applications; 4. the correct use of mathematical language to express both theoretical concepts and logical argument; 5. the use of computers both as an aid and as a tool to study problems in mathematics.	**Teaching/learning methods** Students gain knowledge and understanding through lectures, workshops and computer laboratory sessions where topics are introduced and explored thoroughly before moving forward. **Assessment methods** Students' knowledge and understanding is assessed by a combination of examinations, coursework assignments and presentations.

B. Cognitive (thinking) skills On completion of this programme the successful student will be able to: 1. formulate problems in appropriate theoretical frameworks to facilitate their solution; 2. develop strategies to solve mathematical problems in a range of relevant areas; 3. construct logical arguments solving abstract or applied mathematical problems; 4. criticise mathematical arguments developed by themselves and others.	**Teaching/learning methods** Students learn cognitive skills through working in class, in groups or independently on designated problems and theoretical content under the guidance of staff. **Assessment methods** Students' cognitive skills are assessed formatively in class employing group and individual working sessions, and summatively using a combination of presentations, examinations and coursework.
C. Practical skills On completion of the programme the successful student will be able to: 1. solve practical problems in a range of areas of mathematics; 2. determine the appropriateness of different methods of solving mathematical problems; 3. communicate mathematics effectively to a wide range of audiences; 4. use computer packages where appropriate to develop a deeper understanding of mathematical problems.	**Teaching/learning methods** Students learn practical skills through a series of hands-on sessions throughout their studies designed to explore theoretical content more thoroughly. **Assessment methods** Students' practical skills are assessed formatively in class employing group and individual working sessions, and summatively using a combination of presentations, examinations and coursework.

D. Graduate skills On completion of this programme the successful student will be able to: 1. work effectively and constructively as part of a team; 2. motivate and communicate complex ideas accurately using a range of formats; 3. identify and benefit from opportunities for personal and career development; 4. work confidently and accurately with formulae and numerical information 5. learn effectively	**Teaching/learning methods** Students acquire graduate skills through contribution in class to group and individual work, and outside class through development of assignment work. **Assessment methods** Students' graduate skills are assessed using a combination of presentations, examinations and coursework.

12. Programme structure (levels, modules, credits and progression requirements)

12.1 Overall structure of the programme

Level	Module			
4	MSO1110 Vectors and Matrices (30)	MSO1120 Calculus and Differential Equations (30)	MSO1130 Logic and Structures (30)	MSO1140 Data and Information (30)
5	MSO2110 Groups and Rings (30)	MSO2120 Mathematical Analysis (30)	MSO2130 Discrete Mathematics and Geometry (30)	MSO2140 Problem Solving Methods (30)
6 **(TKSW mode)**	MSO3800 Placement Year (120)			
6	MSO3110 Advanced Algebra (30)	MSO3120 Real and Complex Analysis (30)	MSO3130 Communicating Mathematics (15) Term 1 Option	Term 2 Option Term 2 Option

Term 1 Options: choose **one** from:

- MSO3310 Multivariate Statistics
- MSO3220 Differential Equations

Term 2 Options: choose **two** from:

- MSO3140 Project,
- MSO3170 Combinatorics
- MSO3225 Functional Analysis
- MSO3510 Simulation and Decision Making

12.2 Levels and modules

Starting in academic year 2010/11 the University is changing the way it references modules to state the level of study in which these are delivered. This is to comply with the national Framework for Higher Education Qualifications. This implementation will be a gradual process whilst records are updated. Therefore the old coding is bracketed below.

Level 4 (1)

COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: MSO1110 MSO1120 MSO1130 MSO1140		Students must pass all four level 4 modules to progress

Level 5 (2)

COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: MSO2110 MSO2120 MSO2130 MSO2140		Students must pass all four level 5 modules to progress

Level 6 (3)		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: MSO3110 MSO3120 MSO3130	Students must choose **one** from: MSO3310 MSO3220 and **two** from MSO3140 MSO3170 MSO3510 MSO3225	

12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)	
Module level	**Module code**

13. Curriculum map

See attached.

14. Information about assessment regulations

University assessment regulations apply.

15. Placement opportunities, requirements and support (if applicable)

Students on the TKSW mode take a 12 month placement at the end of year 2. A dedicated Employability Advisor helps in the search for an appropriate employer and provides students with appropriate Placement. They also provide students with appropriate guidance and support in preparation for, during and after placement. The placement forms the basis for an assessed report based on the organisation. At the start of the placement students are allocated an individual supervisor who provides support and advice for the duration of the project.

16. Future careers (if applicable)

Graduates of mathematics courses are employed as professional mathematicians in many organisations, for example GCHQ, where they work on solving abstract problems that directly influence government policy. Mathematics is also fundamental to many other sectors such as commerce, economics, computing, finance, and accounting.

The analytical and logical skills that maths students develop make them well suited to careers in areas such as law. Their ability to analyse and solve complex problems means they are sought after by employers and also demand some of the highest starting salaries.

17. Particular support for learning (if applicable)

English Language Support, Learning Resources, Programme Handbook and Module Handbooks, Induction and orientation programme, Access to student counsellors,Student e-mail and internet access

18. JACS code (or other relevant coding system)	G100
19. Relevant QAA subject benchmark group(s)	MSOR

20. Reference points

- QAA Guidelines for programme specifications
- QAA Qualifications Framework
- Middlesex University Regulations
- Middlesex University Learning Framework – Programme Design Guidance, 2012

21. Other information

Indicators of quality:

- Student achievement
- Buoyant enrolment
- Student feedback evaluation forms
- External examiners reports
- Student employability

Methods for evaluating and improving the quality and standards of learning are:

- External Examiner reports
- Board of Study
- Module evaluation and report
- Peer teaching observations
- Student evaluation
- Validation and review panels

See Middlesex university's Learning and Quality Enhancement Handbook for further information

Please note programme specifications provide a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if s/he takes full advantage of the learning opportunities that are provided. More detailed information about the programme can be found in the rest of your programme handbook and the university regulations.

Curriculum map for BSc Mathematics

This section shows the highest level at which programme outcomes are to be achieved by all graduates, and maps programme learning outcomes against the modules in which they are assessed.

Programme learning outcomes

Knowledge and understanding		Practical skills	
A1	core areas of pure mathematics including geometry, algebra, mathematical analysis and discrete mathematics.	C1	solve practical problems in a range of areas of mathematics.
A2	core areas of applied mathematics including statistics, operational research and differential equations.	C2	determine the appropriateness of different methods of solving mathematical problems.
A3	several specialised areas of advanced mathematics and its applications.	C3	communicate mathematics effectively to a wide range of audiences.
A4	the correct use of mathematical language to express both theoretical concepts and logical argument.	C4	use computer packages where appropriate to develop a deeper understanding of mathematical problems
A5	the use of computers both as an aid and as a tool to study problems in mathematics.		
Cognitive skills		Graduate Skills	
B1	formulate problems in appropriate theoretical frameworks to facilitate their solution.	D1	work effectively and constructively as part of a team.
B2	develop strategies to solve mathematical problems in a range of relevant areas.	D2	motivate and communicate complex ideas accurately using a range of formats.
B3	construct logical arguments solving abstract or applied mathematical problems.	D3	identify and benefit from opportunities for personal and career development;

B4	criticise mathematical arguments developed by themselves and others.	D4	work confidently and accurately with formulae and numerical information
		D5	learn effectively

Programme outcomes																					
A1	A2	A3	A4	A5		B1	B2	B3	B4		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Highest level achieved by all graduates																					
6	6	6	6	6		6	6	6	6		6	6	6	6		6	6	6	6	6	

Module Title	Module Code by Level	Programme outcomes																									
		A1	A2	A3	A4	A5			B1	B2	B3	B4			C1	C2	C3	C4			D1	D2	D3	D4	D5		
Vectors and Matrices	MSO1110	X			X					X								X						X			
Calculus and Differential Equations	MSO1120	X	X			X			X	X					X			X						X			
Logic and Structures	MSO1130	X			X	X				X														X			

Data and Information	MSO1140		X		X	X			X	X					X			X						X	X		
Groups and Rings	MSO2110	X			X					X	X	X												X			
Mathematical Analysis	MSO2120	X			X					X	X	X												X			
Discrete Mathematics and Geometry	MSO2130	X			X	X				X	X	X			X			X						X			
Problem Solving Methods	MSO2140		X			X			X	X	X	X			X	X	X	X			X	X	X	X	X		
Advanced Algebra	MSO3110	X		X	X				X	X	X	X												X			
Real and Complex Analysis	MSO3120	X		X	X				X	X	X	X												X	X		
Communicating Mathematics	MSO3130		X		X	X										X	X	X			X	X	X	X	X		

Project	MSO3140			X		X			X			X			X	X	X	X				X	X	X	X		
Combinatorics	MSO3170			X	X	X			X	X	X	X			X			X						X	X		
Multivariate Statistics	MSO3310			X		X			X						X	X		X						X	X		
Simulation and Decision Making	MSO3510		X	X		X			X						X	X		X						X	X		
Differential Equations	MSO3220		X	X		X			X	X		X			X	X		X						X	X		
Functional Analysis	MSO3225			X	X					X	X	X			X	X								X	X		