

These programme regulations should be read in conjunction with the University's [core regulations for postgraduate programmes](#), and the [marking and classification conventions for postgraduate programmes](#)

MSc Mathematical Sciences (G1K509)

1. Location: Durham City
2. Duration: 12 months (full-time)

Programme structure

3. Candidates shall study and be assessed in the following module:

	Credit value
Dissertation MATH51460	60

4. Candidates shall also study and be assessed in modules to the value of 120 credits from either **List A (Pure Mathematics)**, **List B (Probability)**, **List C (Applied Mathematics and Mathematical Physics)**, or **List D (Mathematical Finance)**. Please note excluded combinations under item 6.

	Credit value
List A (Pure Mathematics)	
Algebraic Topology	MATH41120 20
Analysis	MATH41220 20
Ergodic Theory	MATH43320 20
Functional Analysis and Applications	MATH42920 20
Geometry	MATH41920 20
Number Theory	MATH41620 20
Partial Differential Equations	MATH41720 20
Representation Theory	MATH42220 20
Riemannian Geometry	MATH41320 20
Topics in Algebra and Geometry	MATH41520 20
Topics in Combinatorics	MATH43920 20
List B (Probability)	
Advanced Probability Theory	MATH44320 20
Stochastic Processes	MATH43020 20
Stochastic Analysis	MATH43720 20
Topics in Combinatorics	MATH43920 20
Ergodic Theory	MATH43320 20
Partial Differential Equations	MATH41720 20
Analysis	MATH41220 20
Functional Analysis and Applications	MATH42920 20
List C (Applied Mathematics and Mathematical Physics)	
Advanced Quantum Theory	MATH41020 20
Analysis	MATH41220 20
Functional Analysis and Applications	MATH42920 20
General Relativity	MATH40820 20
Partial Differential Equations	MATH41720 20
Riemannian Geometry	MATH41320 20
Solitons	MATH41420 20
Statistical Mechanics	MATH42320 20
Superstrings	MATH43820 20
Advanced Mathematical Biology	MATH44020 20
Geophysical and Astronomical Fluids	MATH44120 20
List D (Financial Mathematics)	
Stochastic Analysis	MATH43720 20

Stochastic Processes	MATH43020	20
Mathematical Finance	MATH40920	20
Partial Differential Equations	MATH41720	20
Advanced Probability Theory	MATH44320	20
Analysis	MATH41220	20
Functional Analysis and Applications	MATH42920	20
Deep learning, AI and Data Analytics	MATH44220	20
Ergodic Theory	MATH43320	20

5. Candidates in the **List A (Pure Mathematics)** pathway may replace up to 20 credits with modules from **List E**. Candidates in the **List B (Probability)** pathway may replace up to 20 credits with modules from **List F**. Candidates in the **List C (Mathematical Physics)** pathway may replace up to 20 credits with modules from **List G**. Candidates in the **List D (Mathematical Finance)** pathway may replace up to 20 credits with modules from **List H**.

		Credit value
List E (Pure Mathematics - Additional Modules)		
Cryptography and Codes	MATH30120	20
Differential Geometry	MATH30320	20
Galois Theory	MATH30420	20
Topology	MATH30620	20
List F (Probability - Additional Modules)		
Decision Theory	MATH30220	20
Operations Research	MATH30820	20
List G (Applied Mathematics and Mathematical Physics - Additional Modules)		
Differential Geometry	MATH30320	20
Dynamical Systems	MATH30720	20
Geometry of Mathematical Physics	MATH31220	20
Mathematical Biology	MATH30920	20
Quantum Computing	MATH31020	20
Quantum Mechanics	MATH31120	20
Fluid Mechanics	MATH31620	20
List H (Financial Mathematics - Additional Modules)		
Machine Learning and Neural Networks [2]	MATH31520	20
Decision Theory	MATH30220	20
Operations Research	MATH30820	20

6. The following module combinations are excluded in all pathways:
- Analysis [MATH41220](#) AND Functional Analysis and Applications [MATH42920](#)
 - Analysis [MATH41220](#) AND Ergodic Theory [MATH43320](#)
 - Topology [MATH30620](#) AND Algebraic Topology [MATH41120](#)
 - Differential Geometry [MATH30320](#) AND Riemannian Geometry [MATH41320](#)
 - Quantum Mechanics [MATH31120](#) AND Advanced Quantum Theory [MATH41020](#)
 - Geometry of Mathematical Physics [MATH31220](#) AND Advanced Quantum Theory [MATH41020](#)
 - Geophysical and Astronomical Fluids [MATH44120](#) AND Fluid Mechanics [MATH41820](#)
 - Advanced Mathematical Biology [MATH44020](#) AND Mathematical Biology [MATH30920](#)
7. Students wishing to combine modules from different lists must discuss this with the Programme Director.

Assessment, Progression and Award

8. The prerequisite for [MATH51460](#) is 80 credits of MATH Level 4 modules, as given in lists A, B, C, and D. Candidates must satisfy the prerequisite for MATH51460; if this is not achieved they cannot be enrolled on this module and will therefore not be eligible for an MSc, although they may qualify for a Postgraduate Diploma or Postgraduate Certificate, possibly subsequent to resits, as appropriate.
9. For the award of a Postgraduate Diploma candidates must gain a total of 120 credits.

10. For the award of a Postgraduate Certificate candidates must gain a total of 60 credits.