BSc/MSci Mathematics and Statistical Science for 2024/25 (students who started their degree before 2024)

All modules are worth 15 credits unless stated otherwise. 120 credits are taken each year. All modules are at level 4, 5, 6 or 7, corresponding roughly to years 1, 2, 3 and 4.

During all years of the degree, you must take a maximum of 150 credits at Level 4. To graduate with the BSc, you must take a minimum of 90 credits at Level 6 or above during your degree. To graduate with the MSci, you must take a minimum of 120 credits at Level 7 during your degree.

Please note that the choice of optional modules available may vary slightly from year to year and is subject to approval by the Mathematics Departmental Tutor and, in the case of modules from other departments, also to approval from that department.

YEAR 1

All modules are compulsory and at Level 4

Term 1		*Term 2*	
MATH0003	Analysis 1	MATH0004	Analysis 2
MATH0005	Algebra 1	MATH0011	Mathematical Methods 2
MATH0010	Mathematical Methods 1	STAT0003	Further Probability and Statistics
STAT0002	Introduction to Probability and Statistics		
STAT0004	Introduction to Practical Statistics	STAT0004	*continued*

YEAR 2

The modules below are compulsory except for the choice between STAT0025 and STAT0011. All are at level 5 unless noted otherwise.

Term 1		*Term 2*	
MATH0013	Analysis 3: Complex Analysis	MATH0006	Algebra 2
STAT0005	Probability and Inference	MATH0051	Analysis 4: Real Analysis (L6)
STAT0006	Linear Models and the Analysis of Variance	STAT0007	Introduction to Applied Probability
		STAT0023	Linear Models and the Analysis
		STAT0011	Decision and Risk
		OR STAT0045	Statistical Design and Data Ethics

YEAR 3 (BSc)

The module below is compulsory

STAT0008 Statistical Inference (Level 6 Term 1)

Choose 105 credits of options from the following groups:

(i) At least 15 credits and at most 75 credits from **Year 3 Statistics Options for Mathematics and Statistics**

(ii) At least 30 credits and at most 90 credits from **Year 3 Mathematics Options for Mathematics and Statistics**

(iii) At most 15 credits: **CPAS0012 Mathematical Education for Physical and Mathematical Sciences** (i.e. you can choose this module if you wish)

(iv) At most 15 credits of outside options (see below for more detail).

(i) Year 3 Statistics Options for Mathematics and Statistics

Choose from the following Statistics options (at level 6 unless otherwise specified). It may be possible to take other Statistics options: if you wish to do so, please contact the Maths Dept departmental tutor.

Term 1		Term 2	
STAT0009	Stochastic Systems	STAT0010	Forecasting
STAT0013	Stochastic Methods in Finance	STAT0011	Decision and Risk
STAT0014	Medical Statistics 1	STAT0015	Medical Statistics 2
STAT0025	Optimisation Algorithms in Operational Research	STAT0018	Stochastic Methods in Finance II
		STAT0020	Quantitative Modelling of Operational Risk and Insurance Analytics
		STAT0045	Statistical Design and Data Ethics

(ii) Year 3 Mathematics options for Mathematics and Statistics

These are all at level 6 unless otherwise noted, and all worth 15 credits each.

Term 1		Term 2	
MATH0014	Further Linear Algebra (L5)	MATH0018	Functional Analysis

MATH0016	Mathematical Methods 3 (L5)	MATH0020	Differential Geometry
MATH0017	Measure Theory	MATH0028	Combinatorial Optimisation
MATH0019	Multivariable Analysis	MATH0031	Financial Mathematics
MATH0026	Biomathematics	MATH0034	Number T
MATH0029	Graph Theory and Combinatorics	MATH0038	History of Mathematics
MATH0030	Mathematical Ecology	MATH0052	Geometry and Groups (L5)
MATH0032	Introduction to Mathematica	MATH0053	Algebra 4: Groups and Rings
MATH0033	Numerical Methods	MATH0056	Mathematical Methods 4
MATH0037	Logic (term change)	MATH0058	Computational Methods (L5)
MATH0070	Linear Partial Differential Equations (L7)	MATH0069	Probability (L7)
MATH0083	Prime Numbers and their Distribution (L7)	MATH0092	Variational Methods for PDEs (L7)
MATH0109	Theorem proving in LEAN (term change)	MATH0108	Commutative Rings and Algebras
		MATH0114	Mathematics for Machine Learning and Artificial Intelligence (new)

(iv) Outside options

If you wish to choose an outside option, i.e. a module from another department, you should first check information with the relevant department, including pre-requisites and registration procedures. No adjustment can be made to timetables for outside options. Although outside options are normally taken in term 2, it is possible to take an outside option in term 1 or through terms 1 and 2 if the timetable works.

The list of modules which appear in the list here are likely to be reasonably suitable but **still require approval from the teaching department.**   If you wish to take an outside option which does not appear on this list, then you should contact the Mathematics Departmental Tutor to discuss.

BENG0019	Engineering Mathematics in Finance	(Term 2: level 5)
COMP0015	Introduction to Programming	(Term 1 or 2: Level 5)
COMP0142	Machine Learning for Domain Specialists	(Term 2: Level 6)
ECON0008	History of Economic Thought	(Term 1: Level 4)
ECON0011	Basic Microeconomic Concepts	(Term 2: Level 4)
ECON0027	Game Theory	(Term 1: Level 6)
ECON0044	An Introduction to Applied Economic Analysis	(Term 1: Level 4)
INST0002	Programming 1	(Term 2: Level 4)
INST0060	Foundations of Machine Learning	(Term 1: Level 7)
LC*	Language Centre modules	(Term 1 **and** 2: various levels)
MSIN0004	Accounting for Business	(Term 1 or 2: Level 4)
MSIN0048	Understanding Management	(Term 1 or 2: Level 4)
MSIN0059	Managerial Accounting for Decision Making	(Term 1 or 2: Level 5)
MSIN0146	Financial Management	(Term 1: Level 6)
PHAS0022	Quantum Physics	(Term 1: Level 5)

These modules are expected to be offered in 2024-25 but this is not guaranteed and there is no guarantee you will be able to get a place. Please check term.

YEAR 3 (MSci)

1. The module below is compulsory

STAT0008 Statistical Inference (Level 6 Term 1)

2. Choose **EITHER**

(a) MATH0014 Algebra 3 (Term 1) and MATH0053 Algebra 4 (Term 2)

OR

(b) MATH0016 Methods 3 (Term 1) and MATH0056 Methods 4 (Term 2)

OR

(c) 30 credits from the following list of modules

MATH0017 Measure Theory (Term 1)
MATH0018 Functional Analysis (Term 2)
MATH0019 Multivariable Analysis (Term 1)
MATH0020 Differential Geometry (Term 2)
MATH0029 Graph Theory and Combinatorics (Term 1)
MATH0069 Probability (Term 2)
MATH0070 Linear Partial Differential Equations (L7) (Term 1)
MATH0083 Prime Numbers and their Distribution (L7) (Term 1)
MATH0092 Variational Methods for PDEs (L7) (Term 2)

3. Choose at least 15 credits and at most 75 credits from **Year 3 Statistics Options for Mathematics and Statistics**

4. Choose at most 60 credits from **Year 3 Mathematics Options for Mathematics and Statistics**

5. At most 15 credits of outside options (see below for more detail).

(i) Year 3 Statistics Options for Mathematics and Statistics

Choose from the following Statistics options (at level 6 unless otherwise specified). It may be possible to take other Statistics options: if you wish to do so, please contact the Maths Dept departmental tutor.

Term 1		Term 2	
STAT0009	Stochastic Systems	STAT0010	Forecasting
STAT0013	Stochastic Methods in Finance	STAT0011	Decision and Risk

STAT0014	Medical Statistics 1	STAT0015	Medical Statistics 2
STAT0025	Optimisation Algorithms in Operational Research	STAT0018	Stochastic Methods in Finance II
		STAT0020	Quantitative Modelling of Operational Risk and Insurance Analytics
		STAT0045	Statistical Design and Data Ethics

(ii) Year 3 Mathematics options for Mathematics and Statistics

These are all at level 6 unless otherwise noted, and all worth 15 credits each.

Term 1		*Term 2*	
MATH0014	Further Linear Algebra (L5)	MATH0018	Functional Analysis
MATH0016	Mathematical Methods 3 (L5)	MATH0020	Differential Geometry
MATH0017	Measure Theory	MATH0028	Combinatorial Optimisation
MATH0019	Multivariable Analysis	MATH0031	Financial Mathematics
MATH0026	Biomathematics	MATH0034	Number Theory
MATH0029	Graph Theory and Combinatorics	MATH0037	Logic
MATH0030	Mathematical Ecology	MATH0038	History of Mathematics
MATH0032	Introduction to Mathematica	MATH0052	Geometry and Groups (L5)
MATH0033	Numerical Methods	MATH0053	Algebra 4: Groups and Rings
MATH0070	Linear Partial Differential Equations (L7)	MATH0056	Mathematical Methods 4
MATH0083	Prime Numbers and their Distribution (L7)	MATH0058	Computational Methods (L5)
CPAS0012	Mathematical Education for Physical and Mathematical Sciences	MATH0069	Probability (L7)
		MATH0092	Variational Methods for PDEs (L7)
		MATH0108	Commutative Rings and Algebras (new)
		MATH0109	Theorem proving in LEAN (new)

(iii) Year 3 Standard outside options

If you wish to choose an outside option, i.e. a module from another department, you should first check information with the relevant department, including pre-requisites and registration procedures. No adjustment can be made to timetables for outside options. Although outside options are normally taken in term 2, it is possible to take an outside option in term 1 or through terms 1 and 2 if the timetable works.

The list of modules which appear in the list here are likely to be reasonably suitable but **still require approval from the teaching department.** If you wish to take an outside option which does not appear on this list, then you should contact the Mathematics Departmental Tutor to discuss.

BENG0019   Engineering Mathematics in Finance   (Term 2: level 5)

COMP0015	Introduction to Programming	(Term 1 or 2: Level 5)
COMP0142	Machine Learning for Domain Specialists	(Term 2: Level 6)
ECON0008	History of Economic Thought	(Term 1: Level 4)
ECON0011	Basic Microeconomic Concepts	(Term 2: Level 4)
ECON0027	Game Theory	(Term 1: Level 6)
ECON0044	An Introduction to Applied Economic Analysis	(Term 1: Level 4)
INST0002	Programming 1	(Term 2: Level 4)
INST0060	Foundations of Machine Learning	(Term 1: Level 7)
LC*	Language Centre modules	(Term 1 **and** 2: various levels)
MSIN0004	Accounting for Business	(Term 1 or 2: Level 4)
MSIN0048	Understanding Management	(Term 1 or 2: Level 4)
MSIN0059	Managerial Accounting for Decision Making	(Term 1 or 2: Level 5)
MSIN0146	Financial Management	(Term 1: Level 6)
PHAS0022	Quantum Physics	(Term 1: Level 5)

These modules are expected to be offered in 2024-25 but this is not guaranteed and there is no guarantee you will be able to get a place. Please check term.

YEAR 4 (MSci)

Choose one of the following two modules, each at Level 7 and worth 30 credits
MATH0084 (was MATHM901) Project
STAT0035 (was STATM901) Project

Choose 90 credits from
(i) At least 30 credits and at most 60 credits from Standard Year 4 Statistics options for Mathematics and Statistics
(ii) At least 30 credits and at most 60 credits from Standard Year 4 Mathematics options for Mathematics and Statistics (see below for current list)
(iii) On an adhoc basis, any suitable and available UCL modules of 15 credits, on request by the student and subject to Departmental approval.

(i) Standard Year 4 Statistics options

Any suitable Statistics option at level 7.

(ii) Standard Year 4 Mathematics options for Mathematics and Statistics

These are all at level 7 and worth 15 credits

Term 1		Term 2	

MATH0065	Advanced Modelling Mathematical Techniques	MATH0069	Probability
MATH0070	Linear Partial Differential Equations	MATH0090	Elliptic PDEs
MATH0071	Spectral Theory	MATH0092	Variational Methods for PDEs
MATH0083	Prime Numbers and their Distribution	MATH0080	Waves and Wave Scattering
MATH0086	Computational and Simulation Methods	MATH0082	Evolutionary Games and Population Genetics
		MATH0088	Quantitative and Computational Finance
		MATH0102	Applied Stochastic Methods

Year 4 Outside options or 3rd year Mathematics modules (at most 15 credits)

If you wish you can choose up to 15 credits of outside options, i.e. modules from other departments, or 3rd year Mathematics modules. If taking a module from another department, you should first check information, including pre-requisites and registration procedures. No adjustment can be made to timetables for outside options.

The modules which appear here have been taken by Maths students in the past and most are likely to be reasonably suitable. However, there is no guarantee you can take them and they still require approval from the teaching department.   Please note that you can only take outside options at Level 6 or 7 and you should make sure that you have a total of at least 120 credits at level 7 from this and previous years. If you wish to take an outside option which does not appear on this list, then you should contact the Mathematics Departmental Tutor to discuss.

Year 4 Standard outside options

COMP0142   Machine Learning for Domain Specialists   (Term 2: Level 6)
ECON0027   Game Theory   (Term 1: Level 6)
INST0060   Foundations of Machine Learning   (Term 1: Level 7)
LC*   Language Centre modules   (Term 1 **and** 2: level 7)
MSIN0146   Financial Management   (Term 1: Level 6)

These modules are expected to be offered in 2024-25 but this is not guaranteed and there is no guarantee you will be able to get a place. Please check term.

Year 3 Mathematics modules

Term 1		*Term 2*	
MATH0017	Measure Theory	MATH0018	Functional Analysis
MATH0019	Multivariable Analysis	MATH0020	Differential Geometry
MATH0022	Galois Theory	MATH0021	Homological Algebra
MATH0023	Algebraic Topology	MATH0027	Mathematical Methods 5
MATH0025	Mathematics for General Relativity	MATH0028	Combinatorial Optimisation
MATH0026	Biomathematics	MATH0031	Financial Mathematics
MATH0029	Graph Theory and Combinatorics	MATH0035	Algebraic Number Theory
MATH0030	Mathematical Ecology	MATH0036	Elliptic Curves

MATH0032	Introduction to Mathematica	MATH0037	Logic
MATH0033	Numerical Methods	MATH0038	History of Mathematics
		MATH0108	Commutative Rings and Algebras (new)
		MATH0109	Theorem proving in LEAN (new)