

School of Mathematics and Statistics undergraduate regulations

Faculty of Science

INDEX

Regulations are presented in programme code order. An alphabetical index of programme titles is as follows:

MASU04	Environmental Mathematics	(BSc)
MASU05	Financial Mathematics	(BSc)
MASXX	Financial Mathematics (Joint programme with Nanjing University of Technology) (For initial registration of a candidate for the Degree of BSc in Financial Mathematics only)	(BSc)
MASU01	Mathematics	(BSc)
MASU02	Mathematics	(MMath)
MASU21	Mathematics and Astronomy	(BSc)
MASU22	Mathematics and Astronomy	(MMath)
MASU13	Mathematics with French Language	(MMath)
MASU14	Mathematics with German Language	(MMath)
MASU25	Mathematics and Philosophy	(BSc)
MASU23	Mathematics and Physics	(BSc)
MASU15	Mathematics with a Year Abroad	(MMath)
MASU12	Mathematics with Spanish Language	(MMath)
MASU11	Mathematics with Study in Europe	(BSc)
MASU10	Mathematics with Study in Europe	(MMath)
MASU34	Statistics	(G Cert)

MASU01 MATHEMATICS (BSc)

Level 1

1. A candidate shall take the programme of study prescribed at Level 1 of the Regulations for the Degree of MMath in Mathematics (MASU02).

Level 2

2. A candidate shall take the programme of study prescribed at Level 2 of the Regulations for the Degree of MMath in Mathematics (MASU02).

Level 3

3. A candidate shall take
 - (a) units to the value of *one hundred* credits from the following

MAS300	F6	Undergraduate Ambassadors Scheme in Mathematics	10
MAS301	F6	Group Project	10
MAS310	F6	Continuum Mechanics	10
MAS312	F6	Classical Control	10
MAS314	F6	Introduction to Relativity	10
MAS315	F6	Waves	10
MAS320	F6	Fluid Mechanics I	10
MAS322	F6	Operations Research	10

MAS323	F6	Differential Equations: A Case Study	10
MAS324	F6	Milestones in Applied Mathematics II	10
MAS325	F6	Mathematical Methods	10
MAS330	F6	Topics in Number Theory	10
MAS331	F6	Metric Spaces	10
MAS332	F6	Complex Analysis	10
MAS333	F6	Fields	10
MAS334	F6	Combinatorics	10
MAS336	F6	Differential Geometry	10
MAS341	F6	Graph Theory	10
MAS342	F6	Applicable Analysis	10
MAS343	F6	History of Mathematics	10
MAS344	F6	Knots and Surfaces	10
MAS345	F6	Codes and Cryptography	10
MAS346	F6	Groups and Symmetry	10
MAS347	F6	Topics in Mathematical Economics	10
MAS350	F6	Measure and Probability	10
MAS360	F6	Practical and Applied Statistics	20
MAS361	F6	Medical Statistics	10
MAS362	F6	Financial Mathematics	10
MAS363	F6	Linear Models	10
MAS364	F6	Bayesian Statistics	10
MAS370	F6	Sampling Theory and Design of Experiments	10
MAS371	F6	Applied Probability	10
MAS372	F6	Time Series	10
MAS377	F6	Mathematical Biology	10

- (b) unrestricted units to the value of *twenty* credits.

4. With the permission of the Head of Department, up to *thirty* credits at 3(a) may be replaced by units from the following

MAS423	F7	Advanced Operations Research	10
MAS424	F7	Differential Equations (advanced)	10
MAS438	F7	Fields	10
MAS441	F7	Optics and Symplectic Geometry	10
MAS442	F7	Galois Theory	10
MAS460	F7	Stochastic Processes	10
MAS465	F7	Multivariate Data Analysis	10
MAS470	F7	Stochastic Finance	10
MAS472	F7	Computational Inference	10

MASU02 MATHEMATICS (MMath) (JACS G100)

Level 1

1. A candidate shall take

(a)	MAS110	F4	Mathematics Core I	20
	MAS111	F4	Mathematics Core II	20
	MAS112	F4	Vectors and Mechanics	20
	MAS113	F4	Introduction to Probability and Statistics	20
	MAS114	F4	Numbers and Groups	20

- (b) *one* of the following

(i)	MAS115	F5	Mathematical Investigation Skills	20
(ii)	FCP101	F4	Integrated Science	10

unrestricted units to the value of *ten* credits

- (iii) unrestricted units to the value of *twenty* credits

Level 2

2. A candidate shall take

(a)	MAS201	F5	Linear Mathematics for Applications	10
	MAS202	F5	Advanced Calculus	10

- (b) units to the value of *one hundred* credits from the following

MAS203	F5	Mechanics	10
MAS205	F5	Statistics Core	10
MAS207	F5	Continuity and Integration	10
MAS208	F5	Topics in Number Theory	10
MAS270	F5	Vectors and Fluids	10
MAS271	F5	Methods for Differential Equations	10

MAS272	F5	Applied Differential Equations	10
MAS273	F5	Statistical Modelling	10
MAS274	F5	Statistical Reasoning	10
MAS275	F5	Probability Modelling	10
MAS276	F5	Rings and Groups	10
MAS277	F5	Vector Spaces and Fourier Theory	10
MAS278	F5	Nonlinear Mathematics	10
MAS279	F5	Career Development Skills	10

unrestricted units to the value of *twenty* credits

Level 3

3. A candidate shall take units to the value of *one hundred and twenty* credits from the following

MAS300	F6	Undergraduate Ambassadors Scheme in Mathematics	10
MAS301	F6	Group Project	10
MAS310	F6	Continuum Mechanics	10
MAS312	F6	Classical Control	10
MAS314	F6	Introduction to Relativity	10
MAS315	F6	Waves	10
MAS320	F6	Fluid Mechanics I	10
MAS322	F6	Operations Research	10
MAS323	F6	Differential Equations: A Case Study	10
MAS324	F6	Milestones in Applied Mathematics II	10
MAS325	F6	Mathematical Methods	10
MAS330	F6	Topics in Number Theory	10
MAS331	F6	Metric Spaces	10
MAS332	F6	Complex Analysis	10
MAS333	F6	Fields	10
MAS334	F6	Combinatorics	10
MAS336	F6	Differential Geometry	10
MAS341	F6	Graph Theory	10
MAS342	F6	Applicable Analysis	10
MAS343	F6	History of Mathematics	10
MAS344	F6	Knots and Surfaces	10
MAS345	F6	Codes and Cryptography	10
MAS346	F6	Groups and Symmetry	10
MAS347	F6	Topics in Mathematical Economics	10
MAS350	F6	Measure and Probability	10
MAS360	F6	Practical and Applied Statistics	20
MAS361	F6	Medical Statistics	10
MAS362	F6	Financial Mathematics	10
MAS363	F6	Linear Models	10
MAS364	F6	Bayesian Statistics	10
MAS370	F6	Sampling Theory and Design of Experiments	10
MAS371	F6	Applied Probability	10
MAS372	F6	Time Series	10
MAS377	F6	Mathematical Biology	10

unrestricted units to the value of *twenty* credits.

units listed at 4(b) below to the value of *twenty* credits.

Level 4

4. A candidate shall take

(a)	MAS400	F7	Project Presentation in Mathematics and Statistics	10
	MAS406	F7	Mathematics and Statistics Project II	30
(b)	units to the value of <i>eighty</i> credits from the following			
	MAS411	F7	Topics in Advanced Fluid Dynamics	20
	MAS412	F7	Analytical Dynamics and Classical Field Theory	20
	MAS420	F7	Signal Processing	10
	MAS422	F7	Magnetohydrodynamics	10
	MAS423	F7	Advanced Operations Research	10
	MAS424	F7	Differential Equations (Advanced)	10
	MAS430	F7	Analytical Number Theory	10
	MAS432	F7	Group Representations	10
	MAS435	F7	Algebraic Topology	20
	MAS436	F7	Functional Analysis	20
	MAS438	F7	Fields	10
	MAS439	F7	Commutative Algebra and Algebraic Geometry	20

MAS441	F7	Optics and Symplectic Geometry	10
MAS442	F7	Galois Theory	10
MAS452	F7	Stochastic Processes & Finance	20
MAS461	F7	Medical Statistics	10
MAS462	F7	Financial Mathematics	10
MAS463	F7	Linear Models	10
MAS464	F7	Bayesian Statistics	10
MAS465	F7	Multivariate Data Analysis	10
MAS472	F7	Computational Inference	10
MAS473	F7	Extended Linear Models	10

units listed at 3 above to the value of *twenty* credits

5. With the permission of the Head of Department a candidate may replace MAS406 at 4(a) above with the following unit and units to the value of *seventy* credits from 4(b) above
- | | | | |
|--------|----|--|----|
| MAS407 | F7 | Mathematics and Statistics Project III | 40 |
|--------|----|--|----|
6. A candidate must achieve a weighted mean of 59.5 or above at Level Two in order to continue as a candidate for the Degree of MMath in Mathematics (MASU02). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics (MASU01).
7. A candidate must achieve a weighted mean of 54.5 or above at Level Three in order to continue as a candidate for the Degree of MMath in Mathematics (MASU02). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics (MASU01).
8. A candidate shall take at least 120 credits at F7 level in Levels 3 and 4 combined in order to be eligible for the award of MMath in Mathematics (MASU02).

MASU04 ENVIRONMENTAL MATHEMATICS (BSc) (JACS GF18)

Level 2

2. A candidate shall take

(a)	GEO263	F5	Research Design in Physical Geography	10
	MAS201	F5	Linear Mathematics for Applications	10
	MAS202	F5	Advanced Calculus	10
(b)	<i>one of the following</i>			
(i)	MAS203	F5	Mechanics	10
	MAS270	F5	Vectors and Fluids	10
	MAS271	F5	Methods for Differential Equations	10
	MAS272	F5	Applied Differential Equations	10
(ii)	MAS205	F5	Statistics Core	10
	MAS273	F5	Statistical Modelling	10
	MAS274	F5	Statistical Reasoning	10
	MAS275	F5	Probability Modelling	10
(c)	a unit to the value of <i>twenty</i> credits from the following			
	GEO206	F5	Environmental Change	20
	GEO232	F5	Dryland Geomorphology	20
	GEO233	F5	Glacial Environments	20
	GEO234	F5	Atmospheres and Oceans	20
(d)	units to the value of <i>thirty</i> credits from the following			
	GEO210	F5	Geographic Information Systems	10
	GEO211	F5	Remote Sensing	10
	GEO231	F5	Socio-Spatial Analysis	10
	GEO255	F5	Environmental Modelling	10

a unit listed at (c) above

Level 3

3. A candidate shall take

(a)	GEO347	F6	Geo-Environmental Project	20
(b)	<i>one of the following</i>			
(i)	MAS310	F6	Continuum Mechanics	10
	MAS314	F6	Introduction to Relativity	10

	MAS315	F6	Waves	10
	MAS320	F6	Fluid Mechanics I	10
(ii)	units to the value of <i>forty</i> credits from the following			
	MAS360	F6	Practical and Applied Statistics	20
	MAS363	F6	Linear Models	10
	MAS364	F6	Bayesian Statistics	10
	MAS370	F6	Sampling Theory and Design of Experiments	10
	MAS371	F6	Applied Probability	10
	MAS372	F6	Time Series	10
(c)	a unit to the value of <i>twenty</i> credits from the following			
	GEO345	F6	Glacial and Periglacial Geomorphology	20
	GEO351	F6	Environmental Impact Assessment	20
	GEO352	F6	Geological Hazards	20
	GEO354	F6	Contemporary Climate Change	20
	GEO362	F6	GIS and the Environment	20
	GEO365	F6	Dryland Environments Fieldclass	20
	GEO368	F6	Planetary Geoscience	20
	GEO369	F6	Social and Spatial Inequalities	20
(d)	units to the value of <i>forty</i> credits from the following			
	MAS300	F6	Undergraduate Ambassadors Scheme in Mathematics	10
	MAS312	F6	Classical Control	10
	MAS323	F6	Differential Equations: a Case Study	10
	MAS324	F6	Milestones in Applied Mathematics II	10
	MAS325	F6	Mathematical Methods	10
	MAS343	F6	History of Mathematics	10
	MAS377	F6	Mathematical Biology	10
	units listed as 3(b)(ii) or (c) above			

MASU05 FINANCIAL MATHEMATICS (BSc) (JACS GN13)

For students whose initial registration was prior to 2012-13

Level 1

1.	A candidate shall take			
(a)	MAS100	F4	Mathematics with Maple	10
	MAS101	F4	Probability, Sets and Complex Numbers	10
	MAS103	F4	Differential and Difference Equations	10
	MAS113	F4	Introduction to Probability and Statistics	20
	MAS114	F4	Numbers and Groups	20
	MAS170	F4	Practical Calculus	10
	MAS171	F4	Matrices and Geometry	10
	MAS174	F4	Applications of Probability and Statistics	10
	MGT132	F4	Financial Accounting (Accounting for Accountants)	20

Level 2

2.	A candidate shall take			
(a)	MAS201	F5	Linear Mathematics for Applications	10
	MAS202	F5	Advanced Calculus	10
	MAS205	F5	Statistics Core	10
	MAS207	F5	Continuity and Integration	10
	MAS275	F5	Probability Modelling	10
	MGT212	F5	Financial Management	20
	MGT230	F5	Introduction to Corporate Finance and Asset Pricing	20
(b)	units to the value of <i>thirty</i> credits from the following			
	ECN101	F4	Business Economics	10
	MAS271	F5	Methods for Differential Equations	10
	MAS272	F5	Applied Differential Equations	10
	MAS273	F5	Statistical Modelling	10
	MAS274	F5	Statistical Reasoning	10

	MAS276	F5	Rings and Groups	10
	MAS277	F5	Vector Spaces and Fourier Theory	10
	MAS322	F6	Operations Research	10
	MGT213	F5	Issues in Financial Management	20

Level 3

3.	A candidate shall take			
(a)	MAS331	F6	Metric Spaces	10
	MAS362	F6	Financial Mathematics	10
	MAS452	F7	Stochastic Processes & Finance	20
(b)	units to the value of <i>forty</i> credits from the following			
	MAS301	F6	Group Project I	10
	MAS312	F6	Classical Control	10
	MAS322	F6	Operations Research	10
	MAS330	F6	Topics in Number Theory	10
	MAS332	F6	Complex Analysis	10
	MAS343	F6	History of Mathematics	10
	MAS345	F6	Codes and Cryptography	10
	MAS347	F6	Topics in Mathematical Economics	10
	MAS350	F6	Measure and Probability	10
	MAS363	F6	Linear Models	10
	MAS364	F6	Bayesian Statistics	10
	MAS370	F6	Sampling Theory and Design of Experiments	10
	MAS371	F6	Applied Probability	10
	MAS372	F6	Time Series	10
	MAS377	F6	Mathematical Biology	10
	MAS472	F7	Computational Inference	10
(c)	units to the value of <i>forty</i> credits from the following			
	ECN357	F6	Modern Finance	20
	MGT321	F6	Corporate Finance	20
	MGT375	F6	Financial Derivatives	20

For students whose initial registration was for the period 2012-13 or later.

Level 1

1.	A candidate shall take			
(a)	MAS110	F4	Mathematics Core I	20
	MAS111	F4	Mathematics Core II	20
	MAS113	F4	Introduction to Probability and Statistics	20
	MAS114	F4	Numbers and Groups	20
(b)	<i>one</i> of the following			
(i)	ECN105	F4	Economic Analysis & Policy I	20
	ECN107	F4	Economic Analysis & Policy II	20
(ii)	MGT132	F4	Introduction to Financial Accounting	20
	MGT137	F4	Analysis for Decision Making A	20
(iii)	COM160	F4	Computer Problem Solving And Object Oriented Design	20
	MGT132	F4	Introduction to Financial Accounting	20

Level 2

2.	A candidate shall take			
(a)	MAS201	F5	Linear Mathematics for Applications	10
	MAS202	F5	Advanced Calculus	10
	MAS205	F5	Statistics Core	10
	MAS207	F5	Continuity and Integration	10
	MAS275	F5	Probability Modelling	10
	MAS277	F5	Vector Spaces and Fourier Theory	10
(b)	units to the value of <i>twenty</i> credits from			
	MAS273	F5	Statistical Modelling	10
	MAS274	F5	Statistical Reasoning	10
	COM262	F5	Data Structures and Algorithms	10
(c)	One of the following			
(i)	units to the value of <i>forty</i> credits from:			
	ECN201	F5	Microeconomic Principles	20
	ECN202	F5	Macroeconomic Principles	20

ECN216	F5	Econometrics	20
(ii) units to the value of <i>forty</i> credits from:			
MGT212	F5	Financial Management	20
MGT213	F5	Issues in Financial Management	20
MGT230	F5	Introduction to Corporate Finance and Asset Pricing	20

Level 3

3. A candidate shall take			
(a) MAS331	F6	Metric Spaces	10
MAS362	F6	Financial Mathematics	10
MAS452	F7	Stochastic Processes & Finance	20
(b) units to the value of <i>forty</i> credits from the following			
MAS301	F6	Group Project I	10
MAS322	F6	Operations Research	10
MAS343	F6	History of Mathematics	10
MAS347	F6	Topics in Mathematical Economics	10
MAS360	F6	Practical and Applied Statistics	20
MAS363	F6	Linear Models	10
MAS364	F6	Bayesian Statistics	10
MAS370	F6	Sampling Theory and Design of Experiments	10
MAS371	F6	Applied Probability	10
MAS372	F6	Time Series	10
MAS377	F6	Mathematical Biology	10
MAS472	F7	Computational Inference	10
(c) units to the value of <i>forty</i> credits from the following			
ECN340	F6	Further Econometrics	20
ECN357	F6	Modern Finance	20
MGT321	F6	Corporate Finance	20
MGT375	F6	Financial Derivatives	20

MASU10 MATHEMATICS WITH STUDY IN EUROPE (MMath) (JACS G102)**Level 1**

1. A candidate shall take			
(a) MAS110	F4	Mathematics Core I	20
MAS111	F4	Mathematics Core II	20
(b) <i>one</i> of the following			
(i) MAS113	F4	Introduction to Probability and Statistics	20
MAS114	F4	Numbers and Groups	20
MLT units to the value of <i>forty</i> credits			
(ii) MAS112	F4	Vectors and Mechanics	20
MAS113	F4	Introduction to Probability and Statistics	20
MLT units to the value of <i>forty</i> credits			
(iii) MAS112	F4	Vectors and Mechanics	20
MAS114	F4	Numbers and Groups	20
MLT units to the value of <i>forty</i> credits			
(c) (b)(ii) <i>or</i> (iii) may be taken only with the permission of the Head of Department.			

Level 2

2. A candidate shall take			
(a) MAS201	F5	Linear Mathematics for Applications	10
MAS202	F5	Advanced Calculus	10
(b) units to the value of <i>twenty</i> credits from			
MAS203	F5	Mechanics	10
MAS205	F5	Statistics Core	10
MAS207	F5	Continuity and Integration	10
(c) units to the value of <i>forty</i> credits from the following			
MAS270	F5	Vectors and Fluids	10
MAS271	F5	Methods for Differential Equations	10
MAS272	F5	Applied Differential Equations	10

MAS273	F5	Statistical Modelling	10
MAS274	F5	Statistical Reasoning	10
MAS275	F5	Probability Modelling	10
MAS276	F5	Rings and Groups	10
MAS277	F5	Vector Spaces and Fourier Theory	10
MAS278	F5	Nonlinear Mathematics	10

(d) *one* of the following

(i) MLT units to the value of <i>forty</i> credits			
(ii) MAS208	F5	Topics in Number Theory	10
MAS275	F5	Probability Modelling	10
MLT units to the value of <i>twenty</i> credits.			

Level 3

3. A candidate shall take <i>one</i> of the following			
(a) MAS390	F6	Study Abroad	120
(b) MAS391	F6	Study Abroad	110
an appropriate MLT unit to the value of <i>ten</i> credits			
(c) MAS392	F6	Study Abroad	100
appropriate MLT units to the value of <i>twenty</i> credits			

Level 4

4. A candidate shall take			
(a) MAS400	F7	Project Presentation in Mathematics and Statistics	10
MAS406	F7	Mathematics and Statistics Project II	30
(b) units to the value of <i>eighty</i> credits from the following			
MAS411	F7	Topics in Advanced Fluid Dynamics	20
MAS412	F7	Analytical Dynamics and Classical Field Theory	20
MAS420	F7	Signal Processing	10
MAS422	F7	Magnetohydrodynamics	10
MAS423	F7	Advanced Operations Research	10
MAS424	F7	Differential Equations (Advanced)	10
MAS430	F7	Analytical Number Theory	10
MAS432	F7	Group Representations	10
MAS435	F7	Algebraic Topology	20
MAS436	F7	Functional Analysis	20
MAS438	F7	Fields	10
MAS439	F7	Commutative Algebra and Algebraic Geometry	20
MAS441	F7	Optics and Symplectic Geometry	10
MAS442	F7	Galois Theory	10
MAS452	F7	Stochastic Processes & Finance	20
MAS461	F7	Medical Statistics	10
MAS462	F7	Financial Mathematics	10
MAS463	F7	Linear Models	10
MAS464	F7	Bayesian Statistics	10
MAS465	F7	Multivariate Data Analysis	10
MAS472	F7	Computational Inference	10
MAS473	F7	Extended Linear Models	10
appropriate MLT units to the value of <i>twenty</i> credits			
5. With the permission of the Head of Department a candidate may replace MAS406 at 4(a) with the following unit and units to the value of <i>seventy</i> credits from 4(b) above			
MAS407	F7	Mathematics and Statistics Project III	40
6. A candidate must achieve a weighted mean grade of 59.5 or above in the MAS units at Level 2 in order to continue as a candidate for the Degree of MMath in Mathematics with Study in Europe (MASU10). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics (MASU01) or BSc in Mathematics with Study in Europe (MASU11).			

7. A candidate must normally achieve a weighted average of at least 55 in the MLT units at both Level 1 *and* Level 2 in order to continue as a candidate for the Degree of MMath Mathematics with Study in Europe (MASU10). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the MMath Mathematics (MASU02) or BSc Mathematics (MASU01).

MASU11 MATHEMATICS WITH STUDY IN EUROPE (BSc) (JACS G102)

Level 1

1. A candidate shall take the programme of study prescribed at Level 1 in the Regulations for the Degree of MMath in Mathematics with Study in Europe (MASU10).

Level 2

2. A candidate shall take the programme of study prescribed at Level 2 in the Regulations for the Degree of MMath in Mathematics with Study in Europe (MASU10).

Level 3

3. A candidate shall take
- (a) units to the value of *one hundred* credits from the following
- | | | | |
|--------|----|---|----|
| MAS300 | F6 | Undergraduate Ambassadors Scheme in Mathematics | 10 |
| MAS301 | F6 | Group Project | 10 |
| MAS310 | F6 | Continuum Mechanics | 10 |
| MAS312 | F6 | Classical Control | 10 |
| MAS314 | F6 | Introduction to Relativity | 10 |
| MAS315 | F6 | Waves | 10 |
| MAS320 | F6 | Fluid Mechanics I | 10 |
| MAS322 | F6 | Operations Research | 10 |
| MAS323 | F6 | Differential Equations: A Case Study | 10 |
| MAS324 | F6 | Milestones in Applied Mathematics II | 10 |
| MAS325 | F6 | Mathematical Methods | 10 |
| MAS330 | F6 | Topics in Number Theory | 10 |
| MAS331 | F6 | Metric Spaces | 10 |
| MAS332 | F6 | Complex Analysis | 10 |
| MAS333 | F6 | Fields | 10 |
| MAS334 | F6 | Combinatorics | 10 |
| MAS336 | F6 | Differential Geometry | 10 |
| MAS341 | F6 | Graph Theory | 10 |
| MAS342 | F6 | Applicable Analysis | 10 |
| MAS343 | F6 | History of Mathematics | 10 |
| MAS344 | F6 | Knots and Surfaces | 10 |
| MAS345 | F6 | Codes and Cryptography | 10 |
| MAS346 | F6 | Groups and Symmetry | 10 |
| MAS347 | F6 | Topics in Mathematical Economics | 10 |
| MAS350 | F6 | Measure and Probability | 10 |
| MAS360 | F6 | Practical and Applied Statistics | 20 |
| MAS361 | F6 | Medical Statistics | 10 |
| MAS362 | F6 | Financial Mathematics | 10 |
| MAS363 | F6 | Linear Models | 10 |
| MAS364 | F6 | Bayesian Statistics | 10 |
| MAS370 | F6 | Sampling Theory and Design of Experiments | 10 |
| MAS371 | F6 | Applied Probability | 10 |
| MAS372 | F6 | Time Series | 10 |
| MAS377 | F6 | Mathematical Biology | 10 |
- (b) *one* of the following
- (i) appropriate MLT units to the value of *twenty* credits
- (ii) units to the value of *twenty* credits from those listed at 3(a) above.

4. Before proceeding to the final year, a candidate shall spend one session in an appropriate country, in attendance as a full time student at a university or other approved institution, the arrangements being subject to the approval of the Head of Department. During this period the candidate shall take the programme of study prescribed at Level 3 in the Regulations for the Degree of MMath in Mathematics with Study in Europe (MASU10).
5. A candidate must normally achieve a weighted average of at least 55 in the MLT units at both Level 1 *and* Level 2, *and* successfully complete the session outlined in (4) above, in order to continue as a candidate of the Degree of BSc Mathematics with Study in Europe (MASU11). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the BSc Mathematics (MASU01).
6. The final degree classification will be calculated on a 1:2 basis, excluding the mark obtained for the year abroad.

MASU12 MATHEMATICS WITH SPANISH LANGUAGE (MMath) (JACS G1R3)

Level 1

1. A candidate shall take
- (a)
- | | | | |
|--------|----|--|----|
| MAS110 | F4 | Mathematics Core I | 20 |
| MAS111 | F4 | Mathematics Core II | 20 |
| MAS113 | F4 | Introduction to Probability and Statistics | 20 |
| MAS114 | F4 | Numbers and Groups | 20 |
| MLT262 | F4 | Spanish 3A | 10 |
| MLT263 | F4 | Spanish 3B | 10 |
| MLT281 | F4 | Spanish 3C Language Project | 10 |
- (b) a unit to the value of *ten* credits from the following
- | | | | |
|--------|----|---|----|
| MLT347 | F4 | Spanish/English, English/Spanish Tandem Learning, Stage 3 | 10 |
|--------|----|---|----|
- an appropriate MLTC unit to the value of *ten* credits

Level 2

2. A candidate shall take
- (a)
- | | | | |
|---------|----|-------------------------------------|----|
| MAS201 | F5 | Linear Mathematics for Applications | 10 |
| MAS202 | F5 | Advanced Calculus | 10 |
| MAS205 | F5 | Statistics Core | 10 |
| MAS207 | F5 | Continuity and Integration | 10 |
| MLT223I | F5 | Spanish Placement Preparation | 10 |
| MLT312 | F5 | Spanish 4A | 10 |
| MLT313 | F5 | Spanish 4B | 10 |
- (b) units to the value of *forty* credits from the following
- | | | | |
|--------|----|----------------------------------|----|
| MAS273 | F5 | Statistical Modelling | 10 |
| MAS274 | F5 | Statistical Reasoning | 10 |
| MAS275 | F5 | Probability Modelling | 10 |
| MAS276 | F5 | Rings and Groups | 10 |
| MAS277 | F5 | Vector Spaces and Fourier Theory | 10 |
| MAS278 | F5 | Nonlinear Mathematics | 10 |
- (c) a unit to the value of *ten* credits from the following
- | | | | |
|--------|----|--|----|
| MLT219 | F5 | Tandem Learning Module Stage 4 (Spanish / English) | 10 |
| MLT321 | F5 | Spanish Project | 10 |
- an appropriate MLTC unit to the value of *ten* credits

Level 3

3. A candidate shall take
- | | | | |
|--------|----|-----------------------------------|-----|
| MAS392 | F6 | Study Abroad | 100 |
| MLT301 | F6 | Spanish 3D/4D Year Abroad Project | 10 |
| MLT303 | F6 | Spanish 3E/4E Year Abroad Project | 10 |

Level 4

4. A candidate shall take

- (a) MAS400 F7 Project Presentation in Mathematics and Statistics 10
MAS406 F7 Mathematics and Statistics Project II 30
- (b) units to the value of *forty* credits from the following
MLT327 F7 Tandem Learning Module Stage 5 Spanish/English 10
MLT352 F7 Foreign Languages at Work – Spanish Stage 5A 10
MLT353 F7 Foreign Languages at Work – Spanish Stage 5B 10
MLT361 F7 Spanish Project 10
Or an appropriate MLTC unit to the value of *ten* credits
- (c) units to the value of *forty* credits from the following
MAS423 F7 Advanced Operations Research 10
MAS430 F7 Analytical Number Theory 10
MAS432 F7 Group Representations 10
MAS435 F7 Algebraic Topology 20
MAS436 F7 Functional Analysis 20
MAS438 F7 Fields 10
MAS439 F7 Commutative Algebra and Algebraic Geometry 20
MAS441 F7 Optics and Symplectic Geometry 10
MAS442 F7 Galois Theory 10
MAS452 F7 Stochastic Processes and Finance 20
MAS461 F7 Medical Statistics 10
MAS462 F7 Financial Mathematics 10
MAS463 F7 Linear Models 10
MAS464 F7 Bayesian Statistics 10
MAS465 F7 Multivariate Data Analysis 10
MAS472 F7 Computational Inference 10
MAS473 F7 Extended Linear Models 10
5. A candidate must achieve a weighted mean grade of 59.5 or above in the MAS units at Level 2 to continue as a candidate for the Degree of MMath in Mathematics with Spanish Language (MASU12). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics with Study in Europe (MASU11) or BSc in Mathematics (MASU01).
6. A candidate must normally achieve a weighted average of at least 55 in the MLT units at both Level 1 *and* Level 2 in order to continue as a candidate of the degree of MMath Mathematics with Spanish Language (MASU12). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the MMath Mathematics (MASU02) or BSc Mathematics (MASU01).

MASU13 MATHEMATICS WITH FRENCH LANGUAGE (MMath) (JACS G1R1)

Level 1

1. A candidate shall take
- (a) MAS110 F4 Mathematics Core I 20
MAS111 F4 Mathematics Core II 20
MAS113 F4 Introduction to Probability and Statistics 20
MAS114 F4 Numbers and Groups 20
MLT260 F4 French 3A 10
MLT261 F4 French 3B 10
MLT280 F4 French 3C Language Project 10
- (b) a unit to the value of *ten* credits from the following
MLT345 F4 French/English, English/French Tandem Learning, Stage 3 10
an appropriate MLTC unit to the value of *ten* credits

Level 2

2. A candidate shall take
- (a) MAS201 F5 Linear Mathematics for Applications 10

- MAS202 F5 Advanced Calculus 10
MAS205 F5 Statistics Core 10
MAS207 F5 Continuity and Integration 10
MLT221 F5 French Placement Preparation 10
MLT310 F5 French 4A 10
MLT311 F5 French 4B 10
- (b) units to the value of *forty* credits from the following
MAS273 F5 Statistical Modelling 10
MAS274 F5 Statistical Reasoning 10
MAS275 F5 Probability Modelling 10
MAS276 F5 Rings and Groups 10
MAS277 F5 Vector Spaces and Fourier Theory 10
MAS278 F5 Nonlinear Mathematics 10
- (c) a unit to the value of *ten* credits from the following
MLT217 F5 Tandem Learning Module Stage 4 (French / English) 10
MLT320 F5 French Project 10
an appropriate MLTC unit to the value of *ten* credits

Level 3

3. A candidate shall take
MAS392 F6 Study Abroad 100
MLT330 F6 French 4D Year Abroad Project 10
MLT331 F6 French 4E Year Abroad Project 10

Level 4

4. A candidate shall take
- (a) MAS400 F7 Project Presentation in Mathematics and Statistics 10
MAS406 F7 Mathematics and Statistics Project II 30
- (b) units to the value of *forty* credits from the following
MLT325 F7 Tandem Learning Module Stage 5 French/English 10
MLT350 F7 Foreign Languages at Work - French Stage 5A 10
MLT351 F7 Foreign Languages at Work - French Stage 5B 10
MLT360 F7 French Project 10
an appropriate MLTC unit to the value of *ten* credits
- (c) units to the value of *forty* credits from the following
MAS423 F7 Advanced Operations Research 10
MAS430 F7 Analytic Number Theory 10
MAS432 F7 Group Representations 10
MAS435 F7 Algebraic Topology 20
MAS436 F7 Functional Analysis 20
MAS438 F7 Fields 10
MAS439 F7 Commutative Algebra and Algebraic Geometry 20
MAS441 F7 Optics and Symplectic Geometry 10
MAS442 F7 Galois Theory 10
MAS452 F7 Stochastic Processes and Finance 20
MAS461 F7 Medical Statistics 10
MAS462 F7 Financial Mathematics 10
MAS463 F7 Linear Models 10
MAS464 F7 Bayesian Statistics 10
MAS465 F7 Multivariate Data Analysis 10
MAS472 F7 Computational Inference 10
MAS473 F7 Extended Linear Models 10
5. A candidate must achieve a weighted mean grade of 59.5 or above in the MAS units at Level 2 in order to continue as a candidate for the Degree of MMath in Mathematics with French Language (MASU13). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics with Study in Europe (MASU11) or BSc in Mathematics (MASU01).

6. A candidate must normally achieve a weighted average of at least 55 in the MLT units at both Level 1 *and* Level 2 in order to continue as a candidate of the degree of MMath Mathematics with French Language (MASU13). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the MMath Mathematics (MASU02) or BSc Mathematics (MASU01).

MASU14 MATHEMATICS WITH GERMAN LANGUAGE (MMath) (JACS G1R2)

Level 1

1. A candidate shall take
- | | | | | |
|-----|--------|----|--|----|
| (a) | MAS110 | F4 | Mathematics Core I | 20 |
| | MAS111 | F4 | Mathematics Core II | 20 |
| | MAS113 | F4 | Introduction to Probability and Statistics | 20 |
| | MAS114 | F4 | Numbers and Groups | 20 |
| | MLT264 | F4 | German 3A | 10 |
| | MLT265 | F4 | German 3B | 10 |
| | MLT282 | F4 | German 3C Language Project | 10 |
- (b) a unit to the value of *ten* credits from the following
- | | | | | |
|-----|--------|----|---|----|
| (b) | MLT346 | F4 | German/English, English/German Tandem Learning, Stage 3 | 10 |
|-----|--------|----|---|----|
- an appropriate MLTC unit to the value of *ten* credits

Level 2

2. A candidate shall take
- | | | | | |
|-----|---------|----|-------------------------------------|----|
| (a) | MAS201 | F5 | Linear Mathematics for Applications | 10 |
| | MAS202 | F5 | Advanced Calculus | 10 |
| | MAS205 | F5 | Statistics Core | 10 |
| | MAS207 | F5 | Continuity and Integration | 10 |
| | MLT222I | F5 | German Placement Preparation | 10 |
| | MLT314I | F5 | German 4A | 10 |
| | MLT315I | F5 | German 4B | 10 |
- (b) units to the value of *forty* credits from the following
- | | | | | |
|--|--------|----|----------------------------------|----|
| | MAS273 | F5 | Statistical Modelling | 10 |
| | MAS274 | F5 | Statistical Reasoning | 10 |
| | MAS275 | F5 | Probability Modelling | 10 |
| | MAS276 | F5 | Rings and Groups | 10 |
| | MAS277 | F5 | Vector Spaces and Fourier Theory | 10 |
| | MAS278 | F5 | Nonlinear Mathematics | 10 |
- (c) a unit to the value of *ten* credits from the following
- | | | | | |
|--|----------|----|---|----|
| | MLT218AI | F5 | Tandem Learning Module Stage 4 German English | 10 |
| | MLT322 | F5 | German Project | 10 |
- an appropriate MLTC unit to the value of *ten* credits

Level 3

3. A candidate shall take
- | | | | | |
|--|--------|----|----------------------------------|-----|
| | MAS392 | F6 | Study Abroad | 100 |
| | MLT302 | F6 | German 3D/4D Year Abroad Project | 10 |
| | MLT304 | F6 | German 3E/4E Year Abroad Project | 10 |

Level 4

4. A candidate shall take
- | | | | | |
|-----|--------|----|--|----|
| (a) | MAS400 | F7 | Project Presentation in Mathematics and Statistics | 10 |
| | MAS406 | F7 | Mathematics and Statistics Project II | 30 |
- (b) units to the value of *forty* credits from the following
- | | | | | |
|--|--------|----|---|----|
| | MLT326 | F7 | Tandem Learning Module Stage 5 German/English | 10 |
| | MLT354 | F7 | Foreign Languages at Work - German Stage 5A | 10 |
| | MLT355 | F7 | Foreign Languages at Work - German Stage 5B | 10 |
| | MLT362 | F7 | German Project | 10 |

Or an appropriate MLTC unit to the value of *ten* credits

- (c) units to the value of *forty* credits from the following
- | | | | |
|--------|----|--|----|
| MAS423 | F7 | Advanced Operations Research | 10 |
| MAS430 | F7 | Analytic Number Theory | 10 |
| MAS432 | F7 | Group Representations | 10 |
| MAS435 | F7 | Algebraic Topology | 20 |
| MAS436 | F7 | Functional Analysis | 20 |
| MAS438 | F7 | Fields | 10 |
| MAS439 | F7 | Commutative Algebra and Algebraic Geometry | 20 |
| MAS441 | F7 | Optics and Symplectic Geometry | 10 |
| MAS442 | F7 | Galois Theory | 10 |
| MAS452 | F7 | Stochastic Processes & Finance | 20 |
| MAS461 | F7 | Medical Statistics | 10 |
| MAS462 | F7 | Financial Mathematics | 10 |
| MAS463 | F7 | Linear Models | 10 |
| MAS464 | F7 | Bayesian Statistics | 10 |
| MAS465 | F7 | Multivariate Data Analysis | 10 |
| MAS472 | F7 | Computational Inference | 10 |
| MAS473 | F7 | Extended Linear Models | 10 |
5. A candidate must achieve a weighted mean grade of 59.5 or above in the MAS units at Level 2 in order to continue as a candidate for the Degree of MMath in Mathematics with German Language (MASU14). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics with Study in Europe (MASU11) or BSc in Mathematics (MASU01).
6. A candidate must normally achieve a weighted average of at least 55 in the MLT units at both Level 1 *and* Level 2 in order to continue as a candidate of the degree of MMath Mathematics with German Language (MASU14). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the MMath Mathematics (MASU02) or BSc Mathematics (MASU01).

MASU15 MATHEMATICS WITH A YEAR ABROAD (MMath) (JACS G105)

Level 1

1. A candidate shall take
- | | | | | |
|-----|--------|----|--|----|
| (a) | MAS110 | F4 | Mathematics Core I | 20 |
| | MAS111 | F4 | Mathematics Core II | 20 |
| | MAS112 | F4 | Vectors and Mechanics | 20 |
| | MAS113 | F4 | Introduction to Probability and Statistics | 20 |
| | MAS114 | F4 | Numbers and Groups | 20 |
- (b) *one* of the following
- | | | | | |
|------|--------|----|-----------------------------------|----|
| (i) | MAS115 | F5 | Mathematical Investigation Skills | 20 |
| (ii) | FCP101 | F4 | Integrated Science | 10 |
- unrestricted units to the value of *ten* credits
- (iii) unrestricted units to the value of *twenty* credits

Level 2

2. A candidate shall take
- | | | | | |
|-----|--------|----|-------------------------------------|----|
| (a) | MAS201 | F5 | Linear Mathematics for Applications | 10 |
| | MAS202 | F5 | Advanced Calculus | 10 |
| | MAS207 | F5 | Continuity and Integration | 10 |
| | MAS276 | F5 | Rings and Groups | 10 |
| | MAS277 | F5 | Vector Spaces and Fourier Theory | 10 |
| | MAS278 | F5 | Nonlinear Mathematics | 10 |
- (b) units to the value of *sixty* credits from the following
- | | | | | |
|--|--------|----|------------------------------------|----|
| | MAS203 | F5 | Mechanics | 10 |
| | MAS205 | F5 | Statistics Core | 10 |
| | MAS208 | F5 | Topics in Number Theory | 10 |
| | MAS270 | F5 | Vectors and Fluids | 10 |
| | MAS271 | F5 | Methods for Differential Equations | 10 |

MAS272	F5	Applied Differential Equations	10
MAS273	F5	Statistical Modelling	10
MAS274	F5	Statistical Reasoning	10
MAS275	F5	Probability Modelling	10

Level 3

3. A candidate shall take
- | | | | |
|--------|----|--------------|-----|
| MAS390 | F6 | Study Abroad | 120 |
|--------|----|--------------|-----|

Level 4

4. A candidate shall take
- (a) MAS400 F7 Project Presentation in Mathematics and Statistics 10
- MAS406 F7 Mathematics and Statistics Project II 30
- (b) units to the value of *eighty* credits from the following
- | | | | |
|--------|----|--|----|
| MAS411 | F7 | Topics in Advanced Fluid Dynamics | 20 |
| MAS412 | F7 | Analytical Dynamics and Classical Field Theory | 20 |
| MAS420 | F7 | Signal Processing | 10 |
| MAS422 | F7 | Magnetohydrodynamics | 10 |
| MAS423 | F7 | Advanced Operations Research | 10 |
| MAS424 | F7 | Differential Equations (Advanced) | 10 |
| MAS430 | F7 | Analytical Number Theory | 10 |
| MAS432 | F7 | Group Representations | 10 |
| MAS435 | F7 | Algebraic Topology | 20 |
| MAS436 | F7 | Functional Analysis | 20 |
| MAS438 | F7 | Fields | 10 |
| MAS439 | F7 | Commutative Algebra and Algebraic Geometry | 20 |
| MAS441 | F7 | Optics and Symplectic Geometry | 10 |
| MAS442 | F7 | Galois Theory | 10 |
| MAS452 | F7 | Stochastic Processes and Finance | 20 |
| MAS461 | F7 | Medical Statistics | 10 |
| MAS462 | F7 | Financial Mathematics | 10 |
| MAS463 | F7 | Linear Models | 10 |
| MAS464 | F7 | Bayesian Statistics | 10 |
| MAS465 | F7 | Multivariate Data Analysis | 10 |
| MAS472 | F7 | Computational Inference | 10 |
| MAS473 | F7 | Extended Linear Models | 10 |
5. With the permission of the Head of Department a candidate may replace MAS406 at 4(a) with the following unit and units to the value of *seventy* credits from 4(b) above.
- | | | | |
|--------|----|--|----|
| MAS407 | F7 | Mathematics and Statistics Project III | 40 |
|--------|----|--|----|
6. A candidate must achieve a weighted mean grade of 59.5 or above at Level 1, at the first attempt, in order to continue as a candidate for the Degree of MMath in Mathematics with a Year Abroad (MASU15). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of MMath in Mathematics (MASU02).
7. A candidate must achieve a weighted mean grade of 59.5 or above at Level 2, at the first attempt, in order to continue as a candidate for the Degree of MMath in Mathematics with a Year Abroad (MASU15). A candidate who fails to satisfy this requirement may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics (MASU01).

MASU21 MATHEMATICS AND ASTRONOMY (BSc) (JACS GF15)**Level 3**

3. A candidate shall take
- (a) MAS310 F6 Continuum Mechanics 10
- | | | | |
|--------|----|--------------------------------------|----|
| MAS314 | F6 | Introduction to Relativity | 10 |
| MAS315 | F6 | Waves | 10 |
| MAS320 | F6 | Fluid Mechanics I | 10 |
| MAS324 | F6 | Milestones in Applied Mathematics II | 10 |
| PHY305 | F6 | Stellar Atmospheres | 10 |
| PHY306 | F6 | Introduction to Cosmology | 10 |

- | | | | |
|--------|----|-----------------------|----|
| PHY318 | F7 | Concepts of Astronomy | 10 |
| PHY319 | F6 | Astronomy Project | 10 |
- (b) units to the value of *twenty* credits from the following
- | | | | |
|--------|----|------------------------------|----|
| PHY314 | F6 | Relativity and Cosmology | 10 |
| PHY320 | F6 | Nuclear Astrophysics | 10 |
| PHY323 | F7 | Dark Matter and the Universe | 10 |
| PHY324 | F6 | History of Astronomy | 10 |
| PHY461 | F7 | High Energy Astrophysics | 10 |
- (c) a unit to the value of *ten* credits from the following
- | | | | |
|--------|----|--------------------------------------|----|
| MAS322 | F6 | Operations Research | 10 |
| MAS323 | F6 | Differential Equations: A Case Study | 10 |
| MAS325 | F6 | Mathematical Methods | 10 |
| MAS332 | F6 | Complex Analysis | 10 |
| MAS336 | F6 | Differential Geometry | 10 |
| MAS377 | F6 | Mathematical Biology | 10 |
| MAS342 | F6 | Applicable Analysis | 10 |

MASU22 MATHEMATICS AND ASTRONOMY (MMath) (JACS GF15)**Level 3**

3. A candidate shall take
- (a) MAS310 F6 Continuum Mechanics 10
- | | | | |
|--------|----|--------------------------------------|----|
| MAS314 | F6 | Introduction to Relativity | 10 |
| MAS315 | F6 | Waves | 10 |
| MAS320 | F6 | Fluid Mechanics I | 10 |
| MAS324 | F6 | Milestones in Applied Mathematics II | 10 |
| PHY305 | F6 | Stellar Atmospheres | 10 |
| PHY306 | F6 | Introduction to Cosmology | 10 |
| PHY318 | F7 | Concepts of Astronomy | 10 |
| PHY319 | F6 | Astronomy Project | 10 |
- (b) units to the value of *twenty* credits from the following
- | | | | |
|--------|----|------------------------------|----|
| PHY314 | F6 | Relativity and Cosmology | 10 |
| PHY320 | F6 | Nuclear Astrophysics | 10 |
| PHY323 | F7 | Dark Matter and the Universe | 10 |
| PHY324 | F6 | History of Astronomy | 10 |
| PHY461 | F7 | High Energy Astrophysics | 10 |
- (c) a unit to the value of *ten* credits from the following
- | | | | |
|--------|----|-----------------------|----|
| MAS325 | F6 | Mathematical Methods | 10 |
| MAS332 | F6 | Complex Analysis | 10 |
| MAS336 | F6 | Differential Geometry | 10 |
| MAS377 | F6 | Mathematical Biology | 10 |
| MAS342 | F6 | Applicable Analysis | 10 |

Level 4

4. A candidate shall take
- (a) PHY480 F7 Research Project in Physics and Astronomy 40
- (b) units to the value of *forty* credits from the following
- | | | | |
|--------|----|--|----|
| MAS411 | F7 | Topics in Advanced Fluid Dynamics | 20 |
| MAS412 | F7 | Analytical Dynamics and Classical Field Theory | 20 |
| MAS420 | F7 | Signal Processing | 10 |
| MAS422 | F7 | Magnetohydrodynamics | 10 |
| MAS423 | F7 | Advanced Operations Research | 10 |
| MAS424 | F7 | Differential Equations: Advanced Case Studies in Applied Mathematics | 10 |
| MAS445 | F7 | Numerical Methods and Vector Spaces | 10 |
- (c) units to the value of *thirty* credits from the following
- | | | | |
|--------|----|-------------------------------|----|
| PHY323 | F7 | Dark Matter and the Universe | 10 |
| PHY401 | F7 | Cosmic Origins | 20 |
| PHY402 | F7 | Cosmic Origins (Half Module) | 10 |
| PHY445 | F7 | Directed Reading in Astronomy | 10 |
| PHY461 | F7 | High Energy Astrophysics | 10 |
- (d) unrestricted F6 or F7 units to the value of *ten* credits.

5. A candidate must satisfy the requirements of the General Regulations for First Degrees as to progression in order to continue as a candidate for the Degree of MMath in Mathematics and Astronomy (MASU22). A candidate who fails to satisfy these requirements may be required by the Faculty to become instead a candidate for the Degree of BSc in Mathematics and Astronomy (MASU21).
6. A candidate shall take at least 120 credits at F7 level in levels 3 and 4 combined in order to be eligible for the Degree of MMath in Mathematics and Astronomy (MASU22).

MASU23 MATHEMATICS AND PHYSICS (BSc) (JACS GF13)

Level 2

2. A candidate shall take
- | | | | |
|--------|----|-------------------------------------|----|
| MAS201 | F5 | Linear Mathematics for Applications | 10 |
| MAS202 | F5 | Advanced Calculus | 10 |
| MAS203 | F5 | Mechanics | 10 |
| MAS270 | F5 | Vectors and Fluids | 10 |
| MAS271 | F5 | Methods for Differential Equations | 10 |
| MAS272 | F5 | Applied Differential Equations | 10 |
| PHY230 | F5 | Experimental Physics I | 10 |
| PHY250 | F5 | Core Level 2 Physics 1 | 25 |
| PHY251 | F5 | Core Level 2 Physics 2 | 25 |

Level 3

3. A candidate shall take
- (a) PHY205 F5 Electromagnetism 10
PHY315 F7 Techniques of Problem Solving and Physics Essay 10
- (b) a unit to the value of *ten* credits from the following
PHY341 F6 Physics Level 3 Project 1 10
PHY342 F6 Physics Level 3 Project 2 10
- (c) units to the value of *twenty* credits from the following
PHY303 F6 Nuclear Physics 10
PHY304 F6 Particle Physics 10
PHY330 F6 Metals, Semiconductors and Insulators 10
PHY331 F6 Magnetism and Advanced Electrostatics 10
PHY332 F6 Atomic and Laser Physics 10
- (d) a unit to the value of *ten* credits from the following
PHY225 F5 Programming in C 10
PHY227 F5 Optics 10
PHY309 F6 Further Quantum Mechanics 10
PHY314 F6 Relativity and Cosmology 10
PHY320 F6 Nuclear Astrophysics 10
PHY323 F7 Dark Matter and the Universe 10
PHY333 F7 Statistical Physics 10
PHY410 F7 Physics of Semiconductors 10
PHY411 F7 Aspects of Modern Physics (Half Module) 10
a unit listed at 3(c) above
- (e) units to the value of *sixty* credits from the following
MAS300 F6 Undergraduate Ambassadors Scheme in Mathematics 10
MAS310 F6 Continuum Mechanics 10
MAS312 F6 Classical Control 10
MAS314 F6 Introduction to Relativity 10
MAS315 F6 Waves 10
MAS320 F6 Fluid Mechanics I 10
MAS322 F6 Operations Research 10
MAS323 F6 Differential Equations: A Case Study 10
MAS324 F6 Milestones in Applied Mathematics II 10
MAS325 F6 Mathematical Methods 10
MAS330 F6 Topics in Number Theory 10
MAS332 F6 Complex Analysis 10
MAS334 F6 Combinatorics 10
MAS336 F6 Differential Geometry 10
MAS341 F6 Graph Theory 10

MAS342	F6	Applicable Analysis	10
MAS343	F6	History of Mathematics	10
MAS345	F6	Codes and Cryptography	10
MAS377	F6	Mathematical Biology	10

MASU25 MATHEMATICS AND PHILOSOPHY (BSc) (JACS VG51)

Level 1

1. A candidate shall take
- (a) MAS110 F4 Mathematical Core I 20
MAS111 F4 Mathematical Core II 20
MAS114 F4 Numbers and Groups 20
- (b) units to the value of *forty* credits from the following
PHI103 F4 Self and Society 10
PHI107 F4 Philosophy of Religion 10
PHI113 F4 Key Arguments 10
PHI114 F4 History of Philosophy 10
PHI115 F4 Reason and Argument 10
PHI116 F4 Elementary Logic 10
PHI120 F4 The Earliest Greek Philosophers 10
PHI121 F4 Knowledge, Justification and Doubt 10
PHI125 F4 Matters of Life and Death 20
PHI126 F4 Mind, Brain and Personal Identity 20
- (c) unrestricted units to the value of *twenty* credits.

Level 2

2. A candidate shall take
- (a) MAS201 F5 Linear Mathematics for Applications 10
MAS202 F5 Advanced Calculus 10
MAS207 F5 Continuity and Integration 10
- (b) units to the value of *thirty* credits from the following
MAS208 F5 Topics in Number Theory 10
MAS276 F5 Rings and Groups 10
MAS277 F5 Vector Spaces and Fourier Theory 10
MAS278 F5 Nonlinear Mathematics 10
- (c) units to the value of *sixty* credits from the following
PHI201 F5 Reference and Truth 20
PHI202 F5 Philosophy of Mind 20
PHI203 F5 Formal Logic 20
PHI204/219 F5 Ethics: Theoretical and Practical 20
PHI205 F5 Descartes and the Empiricists 20
PHI208/220 F5 Political Philosophy 20
PHI211 F5 Theory of Knowledge 20
PHI216 F5 Feminism: Rationality and Politics 20
PHI217 F5 Plato 20
PHI218 F5 The Rationalists 20
PHI223 F5 Topics in Ancient Philosophy 20
PHI224 F5 Kant's Ethics 20
PHI230 F5 Philosophy of Science 20

Level 3

3. A candidate shall take
- (a) units to the value of *sixty* credits from the following
PHI302 F6 Metaphysics 20
PHI315 F6 Hegel 20
PHI318 F6 Liberty, Community and Democracy 20
PHI320 F6 Pragmatism 20
PHI324 F6 Feminism: Rationality and Politics 20
PHI330 F6 Philosophical Problems II 20
PHI332 F6 Philosophy of Psychology 20
PHI335 F6 Philosophical Problems I 20
PHI336 F6 Kant 20
PHI340 F6 Aristotle 20
PHI346 F6 Desires of One's Own 20
PHI355 F6 Philosophical Project 1 20
PHI356 F6 Philosophical Project 2 20
PHI358 F6 Philosophy of Sex 20
PHI361 F6 Film and Philosophy 20

PHI362	F6	Moral Obligation	20
PHI363	F6	Scepticism	20
(b) units to the value of <i>fifty</i> credits from the following			
MAS300	F6	Undergraduate Ambassadors Scheme in Mathematics	10
MAS322	F6	Operations Research	10
MAS330	F6	Topics in Number Theory	10
MAS331	F6	Metric Spaces	10
MAS332	F6	Complex Analysis	10
MAS333	F6	Fields	10
MAS334	F6	Combinatorics	10
MAS336	F6	Differential Geometry	10
MAS341	F6	Graph Theory	10
MAS342	F6	Applicable Analysis	10
MAS343	F6	History of Mathematics	10
MAS344	F6	Knots and Surfaces	10
MAS345	F6	Codes and Cryptography	10
MAS346	F6	Groups and Symmetry	10
MAS347	F6	Topics in Mathematical Economics	10
MAS377	F6	Mathematical Biology	10
(c) unrestricted units to the value of <i>ten</i> credits.			

MASU34 STATISTICS (GRADUATE CERTIFICATE)

- A candidate shall take

MAS5050	F6	Mathematical Methods for Statistics	20
MAS5051	F6	Probability and Probability Distributions	20
MAS5052	F6	Basic Statistics	20
- A candidate must achieve a mean grade of 40 or above in order to be eligible for the award of Graduate Certificate in Statistics.
- A candidate who achieves a weighted mean grade of 70 or above may be awarded a distinction.
- A candidate who achieves a mean grade of 65 or above may be permitted to register for the Degree of MSc in Statistics. A candidate who achieves a mean grade below 65 may be permitted to register for the Degree of MSc in Statistics only at the discretion of the Head of Department.
- A candidate who has been awarded *sixty* credits shall pass the examination.
- A candidate who fails to satisfy the Examiners in respect of any unit may enter for a subsequent examination in respect of the same unit. A candidate who satisfies the Examiners in a subsequent examination will be awarded a grade of 40 in that examination.

MASXX FINANCIAL MATHEMATICS (BSc)

Joint programme with Nanjing University of Technology

(For initial registration of a candidate for the Degree of BSc in Financial Mathematics only)

- A person who satisfies the admission requirements of the University of Sheffield and of the Nanjing University of Technology may be admitted as a candidate.
- A candidate shall register at Sheffield at the beginning of the programme of study as a student of both the University of Sheffield and of the Nanjing University of Technology. A candidate shall have appropriate access to the facilities of both Universities but shall be required to attend at the University identified in accordance with the following Regulations.
- A candidate will be subject to the General Regulations of both Institutions.

Level 0

- A candidate shall take
 - at the Nanjing University of Technology

MAS113	F4	Introduction to Probability and Statistics	10
--------	----	--	----

Level 1

- A candidate shall take
 - at the Nanjing University of Technology

ECN101	F4	Principles of Economics / Business Economics	10
MAS103	F4	Differential and Difference Equations	10
MAS(174?)	F4	Introduction Probability and Statistics 2	10
MAS271	F5	Methods for Differential Equations	10
MGT132	F4	Introduction to Financial Accounting	10

Level 2

- A candidate shall take
 - at the Nanjing University of Technology

MAS205	F5	Statistics Core	10
MAS207	F5	Continuity and Integration	10
MAS273	F5	Statistical Modelling	10
MAS274	F5	Statistical Reasoning	10
MAS277	F5	Vector Spaces and Fourier Theory	10
MAS322	F6	Operations Research (Game Theory)	10
MAS362	F6	Financial Mathematics	10
MGT212	F5	Financial Management	10

Level 3

- A candidate shall take
 - at the University of Sheffield

MAS331	F6	Metric Spaces	10
MAS347	F6	Topics in Mathematical Economics	10
MAS460	F7	Stochastic Processes	10
MAS470	F7	Stochastic Finance	10
MGT321	F6	Corporate Finance	20

- (b) *one of the following*
- | | | | |
|--------|----|-----------------------|----|
| ECN357 | F6 | Modern Finance | 20 |
| MGT375 | F6 | Financial Derivatives | 20 |
- (c) *units to the value of twenty credits from the following*
- | | | | |
|--------|----|-------------------------|----|
| MAS312 | F6 | Classical Control | 10 |
| MAS330 | F6 | Topics in Number Theory | 10 |
| MAS332 | F6 | Complex Analysis | 10 |
| MAS363 | F6 | Linear Models | 10 |
| MAS364 | F6 | Bayesian Statistics | 10 |
| MAS450 | F7 | Measure and Probability | 10 |
- (d) *units to the value of twenty credits from the following*
- | | | | |
|--------|----|---|----|
| MAS322 | F6 | Operations Research | 10 |
| MAS343 | F6 | History of Mathematics | 10 |
| MAS345 | F6 | Codes and Cryptography | 10 |
| MAS370 | F6 | Sampling Theory and Design of Experiments | 10 |
| MAS371 | F6 | Applied Probability | 10 |
| MAS372 | F6 | Time Series | 10 |
| MAS377 | F6 | Mathematical Biology | 10 |
| MAS472 | F7 | Computational Inference | 10 |
8. A candidate must achieve an overall IELTS score of 6.0 or above at the end of Level 1 in order to continue as a candidate on the Diploma *and* Degree of BSc in Financial Mathematics of the Nanjing University of Technology *and* the Degree of BSc in Financial Mathematics of the University of Sheffield.
 9. A candidate must achieve a weighted mean grade of 65 *or* above at Level 2 in the units provided by Nanjing University of Technology *and* a weighted mean grade of 50 *or* above at Level 2 in the units provided by the University of Sheffield in order to proceed to Level 3 of the University of Sheffield.
 10. A candidate shall (as part of the requirements for the Degree of BSc in Financial Mathematics of the University of Sheffield and unless exempted) attend a 6 week induction programme including English Language training at the University of Sheffield before commencing Level 3.
 11. A candidate who completes satisfactorily Levels 0, 1 and 2 according to the requirements of the General Regulations for First Degrees or equivalent of Nanjing University of Technology may be eligible for the awards of Diploma *and* Degree of BSc in Chemistry of the Nanjing University of Technology.
 12. A candidate who completes satisfactorily Levels 2 and 3 according to the requirements of the General Regulations for First Degrees of the University of Sheffield shall be eligible for the award of the Degree of BSc in Financial Mathematics of the University of Sheffield.
 13. A candidate who does not transfer to the University of Sheffield in Level 3 and who satisfies the requirements of the General Regulations for First Degrees or equivalent of Nanjing University of Technology may proceed to Level 3 in Nanjing University of Technology to complete the Degree of BSc of the Nanjing University of Technology.