These programme regulations should be read in conjunction with the University's core regulations for undergraduate programmes, and the marking and classification conventions for undergraduate programmes.

This document contains separate regulations based on programme start date (from October 2024 and in October 2023 or earlier).

Please ensure that you review the correct programme regulations for your start date.

Master of Mathematics (European Studies)

(for candidates admitted from October 2024)

1. This programme is available at Durham City, in a full-time mode of study.

Level 1 (Certificate)

2. Candidates shall study and be assessed in the following modules:

		Credit value
Calculus I (Maths Hons) #	MATH1081	20
Linear Algebra I (Maths Hons) #	MATH1091	20
Analysis I #	MATH1051	20
Programming I	MATH1587	10
Dynamics I **(students starting before 2025)**	MATH1607	10
Dynamics and Relativity I **(students starting in 2025 onwards)**	MATH1627	10
Probability I	MATH1597	10
Statistics I	MATH1617	10

3. Candidates shall also study and be assessed in EITHER the module

		Credit value
Discrete Mathematics	MATH1031	20

OR module(s) to the value of 20 credits offered by any other Boards of Studies (including up to 20 credits of appropriate language modules offered by the University's Centre for Foreign Language Study).

Level 2 (Diploma)

4. Candidates shall study and be assessed in the following modules:

		Credit value
Mathematical Methods II	MATH2811	20
Complex Analysis II	MATH2791	20

5. Candidates shall also study and be assessed in modules to the value of 40 credits from List 2A and 40 credits from List 2B:

List 2A:		**Credit value**
Algebra II	MATH2781	20
Computational Mathematics II	MATH2731	20
Statistical Inference II	MATH2761	20

List 2B:		**Credit value**
Data Science and Statistical Modelling II	MATH2801	20
Methods of Mathematical Physics II	MATH2741	20
Probability II	MATH2751	20

An open module to the value of 20 credits offered by any other Board of Studies (including a language module offered by the University's Centre for Foreign Language Study) may be substituted for one module in either List 2A or 2B.

Year Abroad (Level 3, Year 3)

6. Candidates shall study and be assessed in the following modules:

		Credit value
MMath (Euro) Level 3 Year Abroad	MATH3986	120

7. This programme is only available to students admitted initially to the MMath Mathematics (G103) programme (or equivalent). Candidates wishing to transfer to MMath with year abroad (G101) must:

   a. successfully complete Level 1 of the MMath Mathematics (G103) programme (or equivalent) with an average mark of 55%, and be eligible to progress to Level 2 of the honours programme;

   b. during Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics with European Studies (G101) and have had their application approved by that Board;

   c. secure an exchange opportunity with an approved international partner institution of the University;

   d. successfully complete Level 2 of their existing programme (G103 or equivalent) so as to be eligible to progress to Level 3;

   e. where tuition at the Overseas Partner Institution is in a foreign language, candidates must have taken at least 20 credits in an appropriate language module at level 1.

Level 4 (Degree)

8. Candidates shall study and be assessed in the following modules:

		Credit value
Mathematical Project IV ~	MATH4072	40

9. Candidates shall also study and be assessed in modules to the value of 80 credits from List 4X and at most one of Lists 4A, 4B, 4C and 4D. The exact modules in each list are still to be confirmed, but will resemble the following:

List 4X:		**Credit value**
Functional Analysis and Applications IV	MATH4371	20
Representation Theory IV	MATH4241	20
Advanced Mathematical Biology IV	MATH4411	20
Topics in Combinatorics IV	MATH4281	20
Topics in Algebra and Geometry IV	MATH4151	20
Quantum Field Theory IV	MATH****	20
Geophysical and Astrophysical Fluids IV	MATH4421	20
High Dimensional Statistics and Deep Learning IV	MATH****	20
Statistical Mechanics IV	MATH4231	20
Uncertainty Quantification and Clinical Trials IV	MATH****	20
List 4A:		
Geometry of Mathematical Physics IV	MATH****	20
Superstrings IV	MATH4271	20
List 4B:		
Nonparametric Statistics IV	MATH4391	20
Spatio-temporal Statistics IV	MATH4341	20
List 4C:		
Algebraic Topology IV	MATH4161	20
Riemannian Geometry IV	MATH4171	20

List 4D:

Advanced Probability IV	MATH4431	20
Stochastic Analysis IV	MATH4261	20

Modules up to the value of 20 credits from another board of studies, subject to the agreement of the Mathematics Board of Studies

Assessment, progression and award

10. Modules marked with the # symbol must be passed at 40% or above in order to progress to the next level of study.
11. Modules marked with the ~ symbol must be passed at 40% or above for the award of an honours degree. A mark of 30-39% cannot be compensated.
12. Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MMath but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Mathematics in accordance with the Core Regulations.
13. A student who is qualified to progress from Level 2 to Level 3 of the MMath but wishes to transfer to Level 3 of the BSc Mathematics shall be permitted to do so.
14. During the third year students must study and be assessed in a mathematics programme (together, possibly, with other topics) in a European university under the Turing Scheme programme. The student is also required to write an essay (about 2000 words, i.e. 4 pages) at the end of year 3 in a non-English language approved by the Director of Education. The essay will be assessed independently by two members of the Durham Department of Mathematical Sciences fluent in the language, and the mark will count 10% of the overall mark of the year. The results obtained will count fully towards the award of the MMath(Euro).
15. Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may transfer to BSc Mathematics (with year abroad) in accordance with the Core Regulations for the award of that degree.
16. The choice of modules at Level 4 is subject to the approval of the course director.
17. Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MMath may be awarded the degree of BSc Mathematics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

These programme regulations should be read in conjunction with the University's core regulations for undergraduate programmes, and the marking and classification conventions for undergraduate programmes.

Master of Mathematics (European Studies) (G101)

(for candidates admitted in October 2023 or earlier)

1. This programme is available at Durham City, in a full-time mode of study.

Level 1 (Certificate)

2. Candidates shall study and be assessed in the following modules:

		Credit value
Calculus I (Maths Hons) #	MATH1081	20
Linear Algebra I (Maths Hons) #	MATH1091	20
Analysis I #	MATH1051	20
Programming I	MATH1587	10
Dynamics I	MATH1607	10
Probability I	MATH1597	10
Statistics I	MATH1617	10

3. Candidates shall also study and be assessed in EITHER the module

		Credit value
Discrete Mathematics	MATH1031	20

OR module(s) to the value of 20 credits offered by any other Boards of Studies (including up to 20 credits of appropriate language modules offered by the University's Centre for Foreign Language Study).

Level 2 (Diploma)

4. Candidates shall study and be assessed in the following modules:

		Credit value
Complex Analysis II	MATH2011	20
Analysis in Many Variables II	MATH2031	20

5. Candidates shall also study and be assessed in at least one module from List A:

List A:		**Credit value**
Algebra II	MATH2581	20
Mathematical Physics II	MATH2071	20
Probability II	MATH2647	10
Statistical Inference II	MATH2711	20

6. Candidates shall also study and be assessed in modules from List B to make a total of 120 credits:

List B:		**Credit value**
Data Science and Statistical Modelling II	MATH2687	10
Elementary Number Theory II	MATH2617	10
Markov Chains II	MATH2707	10
Mathematical Modelling II	MATH2637	10
Numerical Analysis II	MATH2051	20
Special Relativity and Electromagnetism II	MATH2657	10
Statistical Modelling II	MATH2697	10

Topology II	MATH2727	10

An open module to the value of 20 credits offered by any other Board of Studies (including a language module offered by the University's Centre for Foreign Language Study) may be substituted for one module in either List A (if more than one module is taken) or B.

Year Abroad (Level 3, Year 3)

7. Candidates shall study and be assessed in the following modules:

		Credit value
MMath (Euro) Level 3 Year Abroad	MATH3986	120

8. This programme is only available to students admitted initially to the MMath Mathematics (G103) programme (or equivalent). Candidates wishing to transfer to MMath with year abroad (G101) must:

   a. successfully complete Level 1 of the MMath Mathematics (G103) programme (or equivalent) with an average mark of 55%, and be eligible to progress to Level 2 of the honours programme;

   b. during Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics with European Studies (G101) and have had their application approved by that Board;

   c. secure an exchange opportunity with an approved international partner institution of the University;

   d. successfully complete Level 2 of their existing programme (G103 or equivalent) so as to be eligible to progress to Level 3;

   e. where tuition at the Overseas Partner Institution is in a foreign language, candidates must have taken at least 20 credits in an appropriate language module at level 1.

Level 4 (Degree)

9. Candidates shall study and be assessed in the following modules:

		Credit value
Mathematical Project IV ~	MATH4072	40

10. Candidates shall also study and be assessed in modules to the value of 80 credits from one or more of Lists 4A, 4B, 4C, subject to timetable compatibility (note that modules within each list are guaranteed to be timetable compatible:

List 4A:		**Credit value**
Advanced Probability IV	MATH4431	20
Functional Analysis and Applications IV	MATH4371	20
Representation Theory IV	MATH4241	20
Advanced Mathematical Biology IV	MATH4411	20
Stochastic Analysis IV	MATH4261	20
Riemannian Geometry IV	MATH4171	20
Topics in Combinatorics IV	MATH4281	20
Topics in Algebra and Geometry IV	MATH4151	20
Algebraic Topology IV	MATH4161	20
General Relativity IV	MATH4051	20
Advanced Quantum Theory IV	MATH4061	20
Ergodic Theory IV	MATH4361	20

List 4B:		
Functional Analysis and Applications IV	MATH4371	20
Statistical Mechanics IV	MATH4231	20
Representation Theory IV	MATH4241	20
Advanced Mathematical Biology IV	MATH4411	20
Superstrings IV	MATH4271	20
Riemannian Geometry IV	MATH4171	20
Topics in Combinatorics IV	MATH4281	20

Topics in Algebra and Geometry IV	MATH4151	20
Geophysical and Astrophysical Fluids IV	MATH4421	20
General Relativity IV	MATH4051	20
Advanced Quantum Theory IV	MATH4061	20
Ergodic Theory IV	MATH4361	20

List 4C:

Advanced Probability IV	MATH4431	20
Functional Analysis and Applications IV	MATH4371	20
Spatio-Temporal Statistics	MATH4341	20
Advanced Mathematical Biology IV	MATH4411	20
Stochastic Analysis IV	MATH4261	20
Uncertainty Quantification IV	MATH4337	10
Clinical Trials	MATH4407	10
Topics in Combinatorics IV	MATH4281	20
Topics in Algebra and Geometry IV	MATH4151	20
Deep Learning and Artificial Intelligence	MATH4267	10
High-Dimensional Data Analysis IV	MATH4287	10
General Relativity IV	MATH4051	20
Non-Parametric Statistics IV	MATH4391	20
Ergodic Theory IV	MATH4361	20
Modules up to the value of 20 credits from another board of studies, subject to the agreement of the Mathematics Board of Studies		

Assessment, progression and award

11. Modules marked with the # symbol must be passed at 40% or above in order to progress to the next level of study.
12. Modules marked with the ~ symbol must be passed at 40% or above for the award of an honours degree. A mark of 30-39% cannot be compensated.
13. Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MMath but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Mathematics in accordance with the Core Regulations.
14. A student who is qualified to progress from Level 2 to Level 3 of the MMath but wishes to transfer to Level 3 of the BSc Mathematics shall be permitted to do so.
15. During the third year students must study and be assessed in a mathematics programme (together, possibly, with other topics) in a European university under the Turing Scheme programme. The student is also required to write an essay (about 2000 words, i.e. 4 pages) at the end of year 3 in a non-English language approved by the Director of Education. The essay will be assessed independently by two members of the Durham Department of Mathematical Sciences fluent in the language, and the mark will count 10% of the overall mark of the year. The results obtained will count fully towards the award of the MMath(Euro).
16. Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may transfer to BSc Mathematics (with year abroad) in accordance with the Core Regulations for the award of that degree.
17. The choice of modules at Level 4 is subject to the approval of the course director.
18. Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MMath may be awarded the degree of BSc Mathematics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.