

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 (G103)**

**Master of Mathematics with Year Abroad (G117)**

**Master of Mathematics with Placement (G118)**

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:

		<b>Credit value</b>
Calculus I #	<a href="#">MATH1061</a>	20
Linear Algebra I #	<a href="#">MATH1071</a>	20
Analysis I #	<a href="#">MATH1051</a>	20
Programming I	<a href="#">MATH1587</a>	10
Dynamics I	<a href="#">MATH1607</a>	10
Probability I	<a href="#">MATH1597</a>	10
Statistics I	<a href="#">MATH1617</a>	10

3. Candidates shall also study and be assessed in modules to the value of 20 credits offered by any 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:

		<b>Credit value</b>
Complex Analysis II	<a href="#">MATH2011</a>	20
Analysis in Many Variables II	<a href="#">MATH2031</a>	20

5. Candidates shall also study and be assessed in modules to the value of 80 credits from List A:

**List A:**

		<b>Credit value</b>
Algebra II	<a href="#">MATH2581</a>	20
Data Science and Statistical Computing II	<a href="#">MATH2687</a>	10
Elementary Number Theory II	<a href="#">MATH2617</a>	10
Geometric Topology II	<a href="#">MATH2627</a>	10
Markov Chains II	<a href="#">MATH2707</a>	10
Mathematical Physics II	<a href="#">MATH2071</a>	20
Mathematical Modelling II	<a href="#">MATH2637</a>	10
Numerical Analysis II	<a href="#">MATH2051</a>	20
Probability II	<a href="#">MATH2647</a>	10
Special Relativity and Electromagnetism II	<a href="#">MATH2657</a>	10
Statistical Inference II	<a href="#">MATH2711</a>	20
Statistical Modelling II	<a href="#">MATH2697</a>	10

**Year Abroad (Year 3)**

7. This programme is only available to students admitted initially to the MMath Mathematics (G103) programme (or equivalent). Candidates wishing to transfer to MMath Mathematics with year abroad (G117) 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. before the beginning of the first term of Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics with year abroad (G117) and have had their application provisionally approved by that Board;
  - c. during the first term of Level 2 study, have their application formally approved by that Board upon successful completion of the Mathematical Sciences preparatory placement course.

- d. 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.

### Placement (Year 3)

- 8 This programme is only available to students admitted initially to the MMath Mathematics (G103) programme (or equivalent). Candidates wishing to transfer to MMath Mathematics with Placement (G118) must:
- 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;
  - before the beginning of the first term of Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics with placement (G118) and have had their application provisionally approved by that Board;
  - during the first term of Level 2 study, have their application formally approved by that Board upon successful completion of the Mathematical Sciences preparatory placement course.

### Level 3 (Degree)

9. Candidates shall study and be assessed in EITHER modules to the value of 120 credits from list B OR modules to the value of 100 credits from list B and one open 20 credit module chosen from those offered by any other Board of Studies (including appropriate credit-bearing language modules offered by the University's Centre for Foreign Language Study):

<b>List B1 (2021-2022):</b>		<b>Credit value</b>
Bayesian Statistics III	<a href="#">MATH3341</a>	20
Statistical Methods III	<a href="#">MATH3051</a>	20

<b>List B2:</b>		<b>Credit value</b>
Analysis III	<a href="#">MATH3011</a>	20
Cryptography and Codes III	<a href="#">MATH3401</a>	20
Decision Theory III	<a href="#">MATH3071</a>	20
Differential Geometry III	<a href="#">MATH3021</a>	20
Dynamical Systems III	<a href="#">MATH3091</a>	20
Fluid Mechanics III	<a href="#">MATH3101</a>	20
Galois Theory III	<a href="#">MATH3041</a>	20
Geometry III	<a href="#">MATH3201</a>	20
Geometry of Mathematical Physics III	<a href="#">MATH3471</a>	20
Mathematical Biology III	<a href="#">MATH3171</a>	20
Mathematical Finance III	<a href="#">MATH3301</a>	20
Number Theory III	<a href="#">MATH3031</a>	20
Operations Research III	<a href="#">MATH3141</a>	20
Partial Differential Equations III	<a href="#">MATH3291</a>	20
Public Engagement in Mathematical Sciences	<a href="#">MATH3461</a>	20
Quantum Computing III	<a href="#">MATH3391</a>	20
Quantum Mechanics III	<a href="#">MATH3111</a>	20
Solitons III	<a href="#">MATH3231</a>	20
Stochastic Processes III	<a href="#">MATH3251</a>	20
Topology III	<a href="#">MATH3281</a>	20

<b>List B3 (2022-2023 onwards):</b>		<b>Credit value</b>
Advanced Statistical Modelling	<a href="#">MATH3411</a>	20
Bayesian Computation and Modelling	<a href="#">MATH3421</a>	20
Machine Learning and Neural Networks	<a href="#">MATH3431</a>	20

List B1 will not be offered after these dates.

## Level 4 (Degree)

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

Mathematical Project IV	<a href="#">MATH4072</a>	<b>Credit value</b> 40
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10. Candidates shall also study and be assessed in modules to the value of 80 credits from List C:

<b>List C2 (2022-2023):</b>		<b>Credit value</b>
Probability IV	<a href="#">MATH4131</a>	20
Topics in Statistics IV	<a href="#">MATH4071</a>	20

<b>List C1 (2021-2022):</b>		<b>Credit value</b>
Bayesian Statistics IV	<a href="#">MATH4031</a>	20
Mathematical Finance IV	<a href="#">MATH4181</a>	20
Partial Differential Equations IV	<a href="#">MATH4041</a>	20
Stochastic Processes IV	<a href="#">MATH4091</a>	20

<b>List C3:</b>		<b>Credit value</b>
Advanced Quantum Theory IV	<a href="#">MATH4061</a>	20
Algebraic Topology IV	<a href="#">MATH4161</a>	20
Ergodic Theory and Dynamics IV	<a href="#">MATH4361</a>	20
Functional Analysis and Applications IV	<a href="#">MATH4371</a>	20
Topics in Algebra and Geometry IV	<a href="#">MATH4151</a>	20
General Relativity IV	<a href="#">MATH4051</a>	20
Representation Theory IV	<a href="#">MATH4241</a>	20
Riemannian Geometry IV	<a href="#">MATH4171</a>	20
Statistical Mechanics IV	<a href="#">MATH4231</a>	20
Topics in Applied Mathematics IV	<a href="#">MATH4381</a>	20

<b>List C4 (2023-2024 onwards):</b>		<b>Credit value</b>
Spatio-Temporal Statistics	<a href="#">MATH4341</a>	20
Deep Learning and Artificial Intelligence	<a href="#">MATH4267</a>	10
Discrete and Continuous Probability	<a href="#">MATH4277</a>	10
High-Dimensional Data Analysis	<a href="#">MATH4287</a>	10
Non-Parametric Statistics	<a href="#">MATH4297</a>	10
Object-Oriented Statistics	<a href="#">MATH4307</a>	10
Robust Bayesian Analysis	<a href="#">MATH4317</a>	10
Topics in Probability	<a href="#">MATH4327</a>	10
Uncertainty Quantification	<a href="#">MATH4337</a>	10

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

Lists C1 and C2 will not be offered after these dates.

### Assessment, progression and award

11. Modules marked with a # must be passed at 40% or above in order to progress to the Ordinary degree at the next Level.
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 at either Honours or Ordinary level 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. Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in Mathematical Sciences at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

15. 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 in Mathematical Sciences with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

#### **Year Abroad**

16. Students admitted to the MMath Mathematics (G103) are able to apply to transfer to the MMath Mathematics with Year Abroad programme (G117). Students undertaking the MMath Mathematics with Year Abroad programme (G117) will undertake an approved exchange in an overseas university taking a course of study chosen in consultation with the programme director and the host institution.
17. Students who the Board of Examiners for Mathematics deem to have made satisfactory progress on the year abroad will continue to Level 3 of the MMath Mathematics with Year Abroad programme (G117). Students who have not made satisfactory progress on the year abroad will not be permitted to continue on the MMath Mathematics with Year Abroad (G117) programme, but must instead proceed to Level 3 of the MMath Mathematics (G103) programme.

#### **Placement**

18. Students admitted to the MMath Mathematics (G103) are able to apply to transfer to the MMath Mathematics with Placement programme (G118). Students undertaking the MMath Mathematics with Placement programme (G118) will undertake an approved placement chosen in consultation with the programme director and the placement provider.
19. Students who the Board of Examiners for Mathematics deem to have made satisfactory progress on the placement will continue to Level 3 of the MMath Mathematics with Placement programme (G118). Students who have not made satisfactory progress on the placement will not be permitted to continue on the MMath Mathematics with Placement (G118) programme, but must instead proceed to Level 3 of the MMath Mathematics (G103) programme.