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:

| | | Credit value |
|---|---|---|
| Calculus I # | MATH1061 | 20 |
| Linear Algebra I # | MATH1071 | 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 modules to the value of 20 credits from any Board 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 modules to the value of 20 or 40 credits from List A1:

| **List A1:** | | **Credit value** |
|---|---|---|
| Statistical Concepts II | MATH2041 | 20 |
| Numerical Analysis II | MATH2051 | 20 |

6. Candidates shall also study and be assessed in modules to the value of 40 or 60 credits from List A2:

| **List A2:** | | **Credit value** |
|---|---|---|
| Algebra II | MATH2581 | 20 |
| Monte Carlo II | MATH2667 | 10 |
| Elementary Number Theory II | MATH2617 | 10 |
| Geometric Topology II | MATH2627 | 10 |
| Mathematical Physics II | MATH2071 | 20 |
| Mathematical Modelling II | MATH2637 | 10 |
| Probability II | MATH2647 | 10 |
| Special Relativity and Electromagnetism II | MATH2657 | 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:

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 placement (G118) 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.

**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):

| **List B2 (2018-2019):** | | **Credit value** |
|---|---|---|
| Numerical Differential Equations III | MATH3081 | 20 |
| Geometry III | MATH3201 | 20 |
| Probability III | MATH3211 | 20 |
| Statistical Mechanics III | MATH3351 | 20 |
| Topics in Statistics III | MATH3361 | 20 |

| **List B1 (2019-2020):** | | **Credit value** |
|---|---|---|
| Analysis III | MATH3011 | 20 |
| Bayesian Statistics III | MATH3341 | 20 |
| Continuum Mechanics III | MATH3101 | 20 |
| Representation Theory III | MATH3371 | 20 |
| Solitons III | MATH3231 | 20 |
| Stochastic Processes III | MATH3251 | 20 |

| **List B3:** | | **Credit value** |
|---|---|---|
| Cryptography and Codes III | MATH3401 | 20 |
| Decision Theory III | MATH3071 | 20 |
| Differential Geometry III | MATH3021 | 20 |
| Dynamical Systems III | MATH3091 | 20 |
| Galois Theory III | MATH3041 | 20 |
| Mathematical Biology III | MATH3171 | 20 |
| Mathematical Finance III | MATH3301 | 20 |
| Mathematics Teaching III | MATH3121 | 20 |
| Number Theory III | MATH3031 | 20 |
| Operations Research III | MATH3141 | 20 |
| Partial Differential Equations III | MATH3291 | 20 |
| Quantum Information III | MATH3391 | 20 |
| Quantum Mechanics III | MATH3111 | 20 |
| Statistical Methods III | MATH3051 | 20 |
| Topology III | MATH3281 | 20 |

Lists B1 and B2 will be offered in alternate years. List B3 will run in both years.

**Level 4 (Degree)**

7. 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 List C:

| **List C2 (2018-2019):** | | **Credit value** |
|---|---|---|
| Numerical Differential Equations IV | MATH4221 | 20 |
| Geometry IV | MATH4141 | 20 |
| Number Theory IV | MATH4211 | 20 |
| Probability IV | MATH4131 | 20 |
| Statistical Mechanics IV | MATH4231 | 20 |
| Topics in Statistics IV | MATH4071 | 20 |

| **List C1 (2019-2020):** | | **Credit value** |
|---|---|---|
| Analysis IV | MATH4201 | 20 |
| Bayesian Statistics IV | MATH4031 | 20 |
| Continuum Mechanics IV | MATH4081 | 20 |
| Representation Theory IV | MATH4241 | 20 |
| Solitons IV | MATH4121 | 20 |
| Stochastic Processes IV | MATH4091 | 20 |

| **List C3:** | | **Credit value** |
|---|---|---|
| Advanced Quantum Theory IV | MATH4061 | 20 |
| Algebraic Topology IV | MATH4161 | 20 |
| Topics in Algebra and Geometry IV | MATH4151 | 20 |
| General Relativity IV | MATH4051 | 20 |
| Mathematical Finance IV | MATH4181 | 20 |
| Partial Differential Equations IV | MATH4041 | 20 |
| Riemannian Geometry IV | MATH4171 | 20 |
| 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 be offered in alternate years. List C3 will run in both years.

**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.