

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](#).

### **MMath Mathematics and Statistics (G114)**

### **MMath Mathematics and Statistics with Year Abroad (G115)**

### **MMath Mathematics and Statistics with Placement (G116)**

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> |
|---------------------------------|--------------------------|---------------------|
| Analysis I #                    | <a href="#">MATH1051</a> | 20                  |
| Calculus I (Maths Hons) #       | <a href="#">MATH1081</a> | 20                  |
| Linear Algebra I (Maths Hons) # | <a href="#">MATH1091</a> | 20                  |
| Dynamics I                      | <a href="#">MATH1607</a> | 10                  |
| Probability I #                 | <a href="#">MATH1597</a> | 10                  |
| Programming I                   | <a href="#">MATH1587</a> | 10                  |
| Statistics I #                  | <a href="#">MATH1617</a> | 10                  |

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

|                      |                          | <b>Credit value</b> |
|----------------------|--------------------------|---------------------|
| Discrete Mathematics | <a href="#">MATH1031</a> | 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:

|  |                          | <b>Credit value</b> |
|--|--------------------------|---------------------|
| Analysis in Many Variables II          | <a href="#">MATH2031</a> | 20                  |
| Statistical Inference #                | <a href="#">MATH2711</a> | 20                  |
| Data Science and Statistical Computing | <a href="#">MATH2687</a> | 10                  |
| Statistical Modelling                  | <a href="#">MATH2697</a> | 10                  |

5. Candidates shall also study and be assessed in modules to the value of 60 credits from List A:

| <b>List A:</b>                             |                          | <b>Credit value</b> |
|--|--------------------------|---------------------|
| Algebra II                                 | <a href="#">MATH2581</a> | 20                  |
| Complex Analysis II                        | <a href="#">MATH2011</a> | 20                  |
| Mathematical Physics II                    | <a href="#">MATH2071</a> | 20                  |
| Numerical Analysis II                      | <a href="#">MATH2051</a> | 20                  |
| Elementary Number Theory II                | <a href="#">MATH2617</a> | 10                  |
| Markov Chains                              | <a href="#">MATH2707</a> | 10                  |
| Mathematical Modelling II                  | <a href="#">MATH2637</a> | 10                  |
| Probability II                             | <a href="#">MATH2647</a> | 10                  |
| Special Relativity and Electromagnetism II | <a href="#">MATH2657</a> | 10                  |
| Topology II                                | <a href="#">MATH2727</a> | 10                  |

#### **Year Abroad (Year 3)**

6. This programme is only available to students admitted initially to the MMath Mathematics and Statistics (G114) programme (or equivalent). Candidates wishing to transfer to MMath Mathematics and Statistics with year abroad (G115) must:

- a. successfully complete Level 1 of the MMath Mathematics and Statistics (G114) programme (or equivalent) with an average mark of 55%, and be eligible to progress to Level 2 of the programme;
- b. during Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics and Statistics with year abroad (G115) 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 (G114 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.

### Placement (Year 3)

7. This programme is only available to students admitted initially to the MMath Mathematics and Statistics (G114) programme (or equivalent). Candidates wishing to transfer to MMath Mathematics and Statistics with Placement (G116) must:
  - a. successfully complete Level 1 of the MMath Mathematics and Statistics (G114) programme (or equivalent) with an average mark of 55%, and be eligible to progress to Level 2 of the programme;
  - b. during Level 2 study, have applied to the Board of Studies in Mathematical Sciences to be admitted to the MMath Mathematics and Statistics with Placement (G116) and have had their application approved by that Board;
  - c. secure a placement opportunity with an approved employer or institution;
  - d. successfully complete Level 2 of their existing programme (G114 or equivalent) so as to be eligible to progress to Level 3..
8. During the third year candidates shall undertake an approved placement in industry, or in an institution or organisation undertaking research, for 40 weeks.

### Level 3 (Degree)

9. Candidates shall also study and be assessed in modules to the value of at least 60 credits from Lists B and C, where at least 20 credits are taken from list B:

| <b>List B:</b>                     |                          | <b>Credit value</b> |
|------------------------------------|--------------------------|---------------------|
| Advanced Statistical Modelling     | <a href="#">MATH3411</a> | 20                  |
| Bayesian Computation and Modelling | <a href="#">MATH3421</a> | 20                  |

| <b>List C:</b>                       |                          | <b>Credit value</b> |
|--------------------------------------|--------------------------|---------------------|
| Decision Theory                      | <a href="#">MATH3071</a> | 20                  |
| Machine Learning and Neural Networks | <a href="#">MATH3431</a> | 20                  |
| Mathematical Finance                 | <a href="#">MATH3301</a> | 20                  |
| Stochastic Processes                 | <a href="#">MATH3251</a> | 20                  |

10. Candidates shall also study and be assessed to the value of at most 60 credits **EITHER** from List D, which is guaranteed to be timetable compatible with lists B and C:

| <b>List D:</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                  |
| Mathematical Biology III           | <a href="#">MATH3171</a> | 20                  |
| Mathematics into Schools           | <a href="#">MATH3481</a> | 20                  |
| Number Theory III                  | <a href="#">MATH3031</a> | 20                  |
| Partial Differential Equations III | <a href="#">MATH3291</a> | 20                  |
| Advanced Statistical Modelling III | <a href="#">MATH3411</a> | 20                  |

|  |                          |    |
|--|--------------------------|----|
| Bayesian Computation and Modelling III   | <a href="#">MATH3421</a> | 20 |
| Operations Research III                  | <a href="#">MATH3141</a> | 20 |
| Fluid Mechanics III                      | <a href="#">MATH3101</a> | 20 |
| Machine Learning and Neural Networks III | <a href="#">MATH3431</a> | 20 |
| Stochastic Processes III                 | <a href="#">MATH3251</a> | 20 |
| Mathematical Finance III                 | <a href="#">MATH3301</a> | 20 |

**OR**, subject to timetable compatibility, may choose from any modules offered at Level 3 by the Department of Mathematical Sciences, and up to 20 credits of open modules 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).

#### Level 4 (Degree)

11. Candidates shall study and be assessed in one of the following modules:

|                       |                          | <b>Credit value</b> |
|-----------------------|--------------------------|---------------------|
| Project IV            | <a href="#">MATH4072</a> | 40                  |
| Internship Project IV | <a href="#">MATH4352</a> | 40                  |

12. Candidates shall also study and be assessed in modules to the value of at least 40 credits from List E:

| <b>List E:</b>                            |                          | <b>Credit value</b> |
|---|--------------------------|---------------------|
| Spatio-Temporal Statistics                | <a href="#">MATH4341</a> | 20                  |
| Clinical Trials                           | <a href="#">MATH4407</a> | 10                  |
| Deep Learning and Artificial Intelligence | <a href="#">MATH4267</a> | 10                  |
| High-Dimensional Data Analysis            | <a href="#">MATH4287</a> | 10                  |
| Non-Parametric Statistics                 | <a href="#">MATH4391</a> | 20                  |
| Uncertainty Quantification                | <a href="#">MATH4337</a> | 10                  |
| Advanced Probability IV                   | <a href="#">MATH4431</a> | 20                  |
| Stochastic Analysis IV                    | <a href="#">MATH4261</a> | 20                  |

13. Candidates shall also study and be assessed to the value of at most 40 credits **EITHER** from List F, which is guaranteed to be timetable compatible with list E:

| <b>List F:</b>                          |                          | <b>Credit value</b> |
|---|--------------------------|---------------------|
| Functional Analysis and Applications IV | <a href="#">MATH4371</a> | 20                  |
| Advanced Mathematical Biology IV        | <a href="#">MATH4411</a> | 20                  |
| Topics in Combinatorics IV              | <a href="#">MATH4281</a> | 20                  |
| Topics in Algebra and Geometry IV       | <a href="#">MATH4151</a> | 20                  |
| General Relativity IV                   | <a href="#">MATH4051</a> | 20                  |
| Ergodic Theory IV                       | <a href="#">MATH4361</a> | 20                  |

**OR**, subject to timetable compatibility, may choose from any modules offered at Level 4 by the Department of Mathematical Sciences, and up to 20 credits of Level 4 modules chosen from those offered by any other Board of Studies

#### Year Abroad

14. Students admitted to the MMath Mathematics and Statistics (G114) are able to apply to transfer to the MMath Mathematics and Statistics with Year Abroad programme (G115). Students undertaking the MMath Mathematics and Statistics with Year Abroad programme (G115) will undertake an approved year abroad chosen in consultation with the programme director and the host.
15. Students who the Board of Examiners for Mathematics deem to have made satisfactory progress on the placement year will continue to Level 3 of the MMath Mathematics and Statistics with Year Abroad (G115). Students who have not made satisfactory progress on the year abroad will not be permitted to continue on the MMath Mathematics and Statistics with Year Abroad (G115) programme, but must instead proceed to Level 3 of the MMath Mathematics and Statistics (G114) programme.

## **Placement**

16. Students admitted to the MMath Mathematics and Statistics (G114) are able to apply to transfer to the MMath Mathematics and Statistics with Placement programme (G116). Students undertaking the MMath Mathematics and Statistics with Placement programme (G116) will undertake an approved placement chosen in consultation with the programme director and the host.
17. Students who the Board of Examiners for Mathematics deem to have made satisfactory progress on the placement year will continue to Level 3 of the MMath Mathematics and Statistics with Placement (G116). Students who have not made satisfactory progress on the placement will not be permitted to continue on the MMath Mathematics and Statistics with Placement (G116) programme, but must instead proceed to Level 3 of the MMath Mathematics and Statistics (G114) programme.

## **Assessment, progression and award**

18. Modules marked with the # symbol must be passed at 40% or above in order to progress to the next level of study.
19. 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 MathematicsI in accordance with the Core Regulations.
20. 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.
21. 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.
22. 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.