FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND STATISTICS

MATHEMATICS

Master of Mathematics in Mathematics
Master of Mathematics in Mathematics and Statistics
Bachelor of Science with Honours in Mathematics
Bachelor of Science with Honours in Mathematics and Statistics
Bachelor of Science with Honours in Mathematics with Teaching
Bachelor of Science with Honours in Mathematics with Teaching (International)
Bachelor of Science in Mathematics
Diploma of Higher Education in Mathematical Studies
Certificate of Higher Education in Mathematical Studies

These regulations are to be read in conjunction with General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

Mode of Study

1. The programmes are available by both full-time and part time study. Students studying on a part-time basis will normally take modules amounting to 60 credits in each year.

Curriculum (Full-time study)

2. All students shall undertake an approved curriculum as follows:

First Year

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
MM143	Mathematical Foundations	1	20
MM144	Calculus 1	1	20
MM145	Introduction to Geometry and Algebra	1	20
MM106	Essential Statistics	1	10
MM107	Data Analysis and Presentation	1	10
MM146	Mathematics in Society	1	20
	Elective Module(s)		20

Second Year

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
MM201	Linear Algebra and Differential Equations	2	20
MM202	Advanced Calculus	2	20
MM203	Applicable Analysis	2	20
MM204	Probability and Statistical Inference	2	20
MM205	Introduction to Newtonian Mechanics	2	20
MM206	Mathematical and Statistical Computing	2	20

Third Year

Mathematics, and Mathematics and Statistics

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
MM300	Complex Variables and Integral Transforms	3	20
MM301	Linear Algebra	3	20
MM302	Differential Equations	3	20

Optional Modules

For Integrated Masters and Honours students 60 credits chosen from List A (or another module approved by the Programme Director). For Bachelor students 60 credits from List A and List B.

List A

Module Code	Module Title	Level	Credits
MM303	Applicable Analysis 2	3	20
MM304	Inference and Regression Modelling*	3	20
MM305	Mechanics of Rigid Bodies and Fluids	3	20
MM306	Numerical Analysis	3	20
MM307	Stochastics and Financial Econometrics*	3	20

*Compulsory for MMath and Honours students in Mathematics and Statistics.

Not all optional modules on this list will be available in each academic year.

List B

Modules in First and Second Year not previously taken or further Optional Modules (this applies to students who may have transferred from another degree programme and therefore have not completed all Year 1 and Year 2 modules).

Mathematics with Teaching and Mathematics with Teaching (International)

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
MM302	Differential Equations	3	20
MM304	Inference and Regression Modelling	3	20
MM441	Mathematics with Teaching*	4	60

*MM441 Mathematics with Teaching comprises of 60 credits chosen from the list below.

MM441 Mathematics with Teaching Optional Modules**

Module Code	Module Title	Level	Credits
MM402	Modelling and Simulation with Applications to Financial Derivatives	4	20
MM403	Applicable Analysis 3	4	20
MM404	Statistical Modelling and Analysis	4	20
MM405	Fluids and Waves	4	20
MM406	Finite Element Methods for Boundary Value Problems and Approximation	4	20
MM407	Applied Statistics in Society	4	20
MM408	Mathematical Biology and Marine Population Modelling	4	20
MM409	Mathematical Introduction to Networks	4	20
MM415	Medical Statistics	4	20

** Not all optional modules on this list will be available in each academic year.

Optional Modules

No fewer than 20 credits chosen from the following list, or another module approved by the Programme Director.

Module Code	Module Title	Level	Credits
MM301	Linear Algebra	3	20
MM305	Mechanics of Rigid Bodies and Fluids	3	20

Fourth Year

All full-time students shall undertake modules amounting to 120 credits as follows:

Mathematics

Compulsory Module

Module Code	Module Title	Level	Credits
MM400	Mathematics*	4	120

*MM400 Mathematics comprises of:

- MM401 Communicating Mathematics and Statistics (20 credits) and
- 100 credits chosen from Lists A and B or other modules as approved by the Programme Director.

Mathematics and Statistics

Compulsory Module

Module Code	Module Title	Level	Credits
MM410	Mathematics and Statistics*	4	120

*MM410 Mathematics and Statistics comprises of

- MM401 Communicating Mathematics and Statistics (20 credits),
- no fewer than 60 credits from List A and
- no fewer than 40 credits from List B, or other modules as approved by the Programme Director.

Mathematics and Mathematics and Statistics Optional Modules

List A

Module Code	Module Title	Level	Credits
MM402	Modelling and Simulation with Applications to Financial Derivatives	4	20

MM404	Statistical Modelling and Analysis	4	20
MM407	Applied Statistics in Society	4	20
MM415	Medical Statistics	4	20

List B – subject to availability

Module Code	Module Title	Level	Credits
MM402	Modelling and Simulation with Applications to Financial Derivatives	4	20
MM403	Applicable Analysis 3	4	20
MM405	Fluids and Waves	4	20
MM406	Finite Element Methods for Boundary Value Problems and Approximations	4	20
MM408	Mathematical Biology and Marine Population Modelling	4	20
MM409	Mathematical Introduction to Networks	4	20

Not all optional modules on these lists will be available in each academic year.

Mathematics with Teaching

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
X7457	Educational Studies: Professional Values 1	4	20
X7459	Professional Learning Through Enquiry 1	4	20
X7460	Professional Skills – Professional Practice 1	4	40
X7461	Professional Skills: Curriculum and Pedagogy Mathematics 1	4	40

Note that Education modules may run before the start of Semester 1 and during the January Consolidation and Development week.

Mathematics with Teaching (International)

All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
X7457	Educational Studies : Professional Values 1	4	20
X7459	Professional Learning Through Enquiry 1	4	20
X7461	Professional Skills : Curriculum and Pedagogy Mathematics 1	4	40
X7496	Placement Learning : Community	4	20
X7497	Learning on Placement	4	20

Note that Education modules may run before the start of Semester 1 and during the January Consolidation and Development week.

Fifth Year

All full-time students shall undertake modules amounting to 120 credits as follows:

Mathematics

Compulsory Module

Module Code	Module Title	Level	Credits
MM500	Mathematics*	5	120

*MM500 Mathematics comprises:

- MM501 Project (40 credits) and
- 80 credits of Optional Modules.

Mathematics and Statistics

Compulsory Module

Module Code	Module Title	Level	Credits
MM510	Mathematics and Statistics*	5	120

*MM510 Mathematics and Statistics comprises:

- MM501 Project (40 credits) and
- 80 credits of Optional Modules.

Mathematics, and Mathematics and Statistics Optional Modules – subject to availability

Module Code	Module Title	Level	Credits
MM502	Modelling and Simulation with Applications to Financial Derivatives	5	20

MM503	Applicable Analysis 3	5	20
MM505	Fluids and Waves	5	20
MM506	Finite Element Methods for Boundary Value Problems and Approximation	5	20
MM508	Mathematical Biology and Marine Population Modelling	5	20
MM509	Mathematical Introduction to Networks	5	20
MM511	Elasticity and Complex Materials	5	20
MM512	Optimisation: Theory and Practice	5	20
MM513	Statistical Mechanics	5	20
MM514	Dynamical Models in Epidemiology	5	20
MM515	Topics in Applied Analysis	5	20
MM516	Topics in Applied Statistics	5	20
MM517	Topics in Applied Mathematics	5	20
MM518	Topics in Numerical Analysis	5	20
MM519	Topics in Biological and Ecological Modelling	5	20
MM554	Applied Mathematics Methods 1	5	20
MM909	Medical Statistics	5	20
MM911	Effective Statistical Consultancy	5	10
MM912	Survey Design and Analysis	5	10
MM913	Quantitative Risk Analysis	5	10
MM915	Spatial Statistics	5	10
MM953	Experimental Design	5	10
MM954	Multivariate Analysis	5	10
MM960	Statistical Machine Learning	5	10
MM962	Data Dashboards with R Shiny	5	10
MM521	Mathematics of Machine Learning	5	20

Or other modules approved by the Programme Director. Not all optional modules on this list will be available in each academic year.

Progress

3. To progress to the second year of either the MMath or BSc with Honours degrees in addition to satisfying the requirements of the General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level, students must gain passes in MM143 Mathematical Foundations and MM144Calculus 1.

4. To progress to second year of the BSc Mathematics degree, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

5. To progress to third year of either the MMath or BSc with Honours degrees in addition to satisfying the requirements of the General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level, students must gain passes in in MM201 Linear Algebra and Differential Equations and MM202 Advanced Calculus.

6. To progress to third year of the BSc Mathematics Degree, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

7. To progress to fourth year of either the MMath or BSc with Honours degrees a candidate must have accumulated at least 120 credits at level 3 or above. In addition, students on the Mathematics with Teaching Degree must meet the requirements for entering Initial Teacher Education.

8. To progress to fifth year of the MMath degrees, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

Progress (Part-time study)

9. See General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

Final Assessment and Classification

10. On successful completion of the fourth year, a candidate will be awarded 120 Level 4 credits under the module code MM400 Mathematics or MM410 Mathematics and Statistics.

11. On successful completion of the fifth year, a candidate will be awarded 120 Level 5 credits under the module code MM500 Mathematics or the module code MM510 Mathematics and Statistics.

12. The final classification for the degrees of MMath in Mathematics and MMath in Mathematics and Statistics will normally be based on the first assessed attempt at compulsory and specified optional modules at Levels 4 and 5 taken in the fourth and fifth years.

13. The final classification for the degree of BSc with Honours in Mathematics or Mathematics and Statistics will normally be based on the first assessed attempt at compulsory and specified optional modules at Levels 3 and 4 taken in the third and fourth years.

Award

14. **MMath in Mathematics, MMath in Mathematics and Statistics**: see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

15. **BSc with Honours in Mathematics, BSc with Honours in Mathematics and Statistics**: see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

16. **BSc with Honours in Mathematics with Teaching, BSc with Honours in Mathematics with Teaching (International)**: In order to qualify for the award of the degree of BSc with Honours a candidate must have accumulated no fewer than 480 credits from the programme curriculum.

    Notwithstanding the General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level, these must include:

    i. the credits for all the compulsory Level 4 Education modules taken individually;
    ii. no fewer than 240 credits at Levels 3 and 4 with at least 180 credits at Level 4.

17. **BSc in Mathematics**: see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

18. **Diploma of Higher Education in Mathematical Studies**: see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

19. **Certificate of Higher Education in Mathematical Studies**: see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.