FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND STATISTICS

MATHEMATICS AND PHYSICS

Bachelor of Science with Honours in Mathematics and Physics
Bachelor of Science in Mathematics and Physics
Diploma of Higher Education in Mathematics and Physics
Certificate of Higher Education in Mathematics and Physics

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

Curriculum (Full-time study)

1. **First Year** - All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Module Code	Module Title	Level	Credits
MM101	Introduction to Calculus	1	20
MM102	Applications of Calculus	1	20
MM123	Geometry and Algebra	1	10
MM106	Essential Statistics	1	10
PH180	Experimental Physics	1	20
PH183	Mechanics and Waves	1	20
PH184	Quantum Physics and Electromagnetism	1	20

2. **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
MM206	Mathematical and Statistical Computing	2	20
PH283	Mechanics and Waves	2	20

PH284	Quantum Physics and Electromagnetism	2	20
	Elective Module(s)		20

3. **Third Year** - 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
MM302	Differential Equations	3	20
PH384	Quantum Physics and Electromagnetism	3	20
PH386	Condensed Matter Physics	3	20
PH387	Gasses, Liquids and Thermodynamics	3	20

Optional Modules

20 credits chosen by Honours students from List A, or another module approved by the Programme Director; and by other students from Lists A and B.

List A

Module Code	Module Title	Level	Credits
MM301	Linear Algebra	3	20
MM305	Mechanics of Rigid Bodies and Fluids	3	20
MM306	Numerical Analysis	3	20

List B
Modules listed in Programme Handbook and Optional Modules not previously taken.

4. **Fourth Year** - All full-time students shall undertake modules amounting to 120 credits as follows:

Compulsory Modules

Mathematics and Physics

Module Code	Module Title	Level	Credits
MM430	Mathematics and Physics	4	120

MM430 Mathematics and Physics comprises:

Module Code	Module Title	Level	Credits
MM401	Communicating Mathematics and Statistics	4	20
Or			
PH450	Project (Physics)	4	40

and Optional Modules chosen from lists A and B (or another module approved by the Programme Director) so that the curriculum contains no fewer than 40 credits in each subject.

List A

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
MM411	Elasticity and Complex Materials	4	20
MM412	Optimization: Theory and Practice	4	20
MM413	Statistical Mechanics	4	20
MM414	Dynamical Models in Epidemiology	4	20
MM415	Medical Statistics	4	20

Not all optional modules on this list will be available in each academic year. Please check your programme handbook for confirmation of which optional modules will run.

List B

Module Code	Module Title	Level	Credits
PH421	Applied High Performance Computing	4	20
PH422	Topics in Quantum Mechanics	4	20
PH423	Complex and Nonlinear Systems	4	20
PH452	Topics in Physics	4	20
PH453	Topics in Solid State Physics	4	20
PH454	Topics in Nanoscience	4	20
PH455	Topics in Photonics	4	20
PH457	Topics in Theoretical Physics	4	20
PH459	Topics in Atomic, Molecular and Nuclear Physics	4	20

Not all optional modules on this list will be available in each academic year. Please check your programme handbook for confirmation of which optional modules will run.

Curriculum (Part-time study)
5. Students studying on a part-time basis will normally take modules amounting to 60/70 credits in each year.

Progress
6. In order to progress to the second year of the Honours programme in addition to satisfying the requirements of General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level, a student must also gain a pass in the following modules: MM101 Introduction to Calculus and MM102 Applications of Calculus.

7. In order to progress to the second year of the Bachelors programme, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

8. In order to progress to the third year of the Honours programme in addition to satisfying the requirements of General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level, a student must also gain a pass in the following module: MM201 Linear Algebra and Differential Equations.

9. In order to progress to the third year of the Bachelors programme, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

10. In order to progress to the fourth year of the programme, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

Progress (Part-time study)
11. See General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

Final Assessment and Classification

12. On successful completion of the fourth year, a candidate will be awarded 120 Level 4 credits under the module code MM430 Mathematics and Physics.

13. The final classification for the degree of BSc with Honours in Mathematics and Physics 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. **BSc with Honours**: In order to qualify for the award of the degree of BSc with Honours in Mathematics and Physics, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

15. **BSc**: In order to qualify for the award of the degree of BSc in Mathematics and Physics, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

16. **Diploma of Higher Education**: In order to qualify for the award of a Diploma of Higher Education in Mathematics and Physics, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.

17. **Certificate of Higher Education**: In order to qualify for the award of a Certificate of Higher Education in Mathematics and Physics, see General Academic Regulations – Undergraduate, Integrated Master and Professional Graduate Degree Programme Level.