School of Mathematics & Statistics

Important Degree Information:

B.Sc./M.A. Honours
The general requirements are 480 credits over a period of normally 4 years (and not more than 5 years) or part-time equivalent; the final two years being an approved Honours programme of 240 credits, of which 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 (H) levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or M.A. degree.

B.Sc./M.A. Honours with Integrated Year Abroad
The general requirements are 540 credits over a period of normally 5 years (and not more than 6 years) or part-time equivalent; the final three years being an approved Honours programme of 300 credits, of which 60 credits are gained during the integrated year abroad, 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 (H) levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or M.A. degree.

M.Math. Honours
General requirements are 600 credits over a period of normally 5 years or 4 years with Advanced Standing (and in no circumstances more than 6 years) or part-time equivalent; an approved Honours programme of at least 330 credits of which 120 credits are at 5000 level and at least a further 210 are at 3000 level and above.

Other Information: In the case of students who spend part of the BSc/MA Honours programme abroad on a recognised Exchange Scheme, the Programme Requirements will be amended to take into account courses taken while abroad.

Degree Programmes	Programme Requirements at:
(M.Math. Honours): **Applied Mathematics**	**Single Honours M.Math. Applied Mathematics Degree:** **Level 1:** At least 20 credits comprising MT1002 **Level 2:** At least 60 credits comprising at least grade 15 in MT2001 and MT2003 **Level 3:** At least 60 credits comprising MT3501, MT3503, MT3504, MT3601 **Level 4:** At least 45 credits comprising MT4005, MT4509 and MT4510. In addition at least one of MT4111, MT4112, MT5611 and MT5612 **Level 5:** At least 120 credits overall which must include MT5999 and at least 60 credits from MT5802, MT5806, MT5809, MT5810, MT5990

Degree Programmes	Programme Requirements at:
(M.Math. Honours): **Mathematics**	**Single Honours M.Math Mathematics Degree:** **Level 1:** At least 20 credits including MT1002. In addition credit in one of MT1007, MT1008, MT2004 must normally be gained at some stage. **Level 2:** At least 90 credits including MT2001 (at grade 15 or better), and two of MT2002, MT2003, MT2004 and MT2005 (with one at grade 15, or better, and another at grade 11 or better) **Level 3:** At least 60 credits including MT3501, MT3503, MT3504 and at least one of MT3600, MT3601 and MT3606 **Level 4:** At least 30 credits including at least 2 of MT4003, MT4004, MT4509, MT4510, MT4606. **Level 5:** At least 120 credits overall which must include MT5999 and at least 60 credits from MT5751-MT5753, MT5757-MT5759, MT5802, MT5806, MT5809, MT5810, MT5823-MT5829MT5830, MT5990. In addition at least one of MT3607, MT4111, MT4112, MT5611 and MT5612.
(M.Math. Honours): **Pure Mathematics**	**Single Honours M.Math Pure Mathematics Degree:** **Level 1:** At least 20 credits including MT1002 **Level 2:** At least 60 credits including a pass at 15 or better in MT2001 and MT2002 **Level 3:** At least 60 credits including MT3501, MT3503, MT3504 and MT3600 **Level 4:** At least 30 credits including MT4003 and MT4004. In addition at least one of MT4111, MT4112, MT5611 and MT5612. **Level 5:** At least 120 credits overall which must include MT5999 and at least 60 credits from MT5823-MT5830, MT5990
(M.Math. Honours): **Statistics**	**Single Honours Statistics M.Math. Degree:** **Level 1:** At least 20 credits including MT1002 **Level 2:** At least 60 credits including a pass at 15 or better in MT2001 and MT2004 **Level 3:** At least 45 credits including MT3501, MT3606 and MT3607 **Level 4 & Level 5:** The programme must include: - at least one of MT4527 and MT4608; - at least one of MT5701 and MT5831; - at least two of MT5751, MT5752, MT5757, MT5758, MT5759; - MT5753; - A project MT5999 on a statistical topic; - At least 120 credits at level 5.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours or M.A. Honours): **Mathematics**	**Single Honours Mathematics Degrees:** **Level 1:** At least 20 credits comprising MT1002 In addition credit in one of MT1007, MT1008 or MT2004 must normally be gained at some stage. **Level 2:** At least 60 credits comprising passes at 11, or better, in MT2001 and at least one of MT2002, MT2003, MT2004 and MT2005 **Level 3 and 4:** - 45 credits comprising MT3501, MT3503 and MT3504; - at least one of MT3600, MT3601 and MT3606 - MT4599; - at least one of MT3607, MT4111, MT4112.
(B.Sc. Honours): **Mathematics and Chemistry, Computer Science, Economics, Geography, Internet Computer Science, Logic & Philosophy of Science, Management Science, Physics, Psychology.** (M.A. Honours): **Mathematics and Ancient History, Arabic, Art History, Biblical Studies, Classical Studies, Economics, Hebrew, International Relations, Italian^, Latin, Mediaeval History, Modern History, Philosophy, Psychology, Russian^, Scottish History, Spanish^, Theological Studies.** ^ available also as 'With Integrated Year Abroad Degrees'	**Mathematics element of Joint Honours Degrees:** **Level 1:** 20 credits comprising MT1002 **Level 2:** 60 credits comprising passes at 11 or better in MT2001 and one of MT2002 or MT2003 **Level 3 and level 4:** Normally a total of 120 credits which must include: - at least two of MT3501, MT3503 and MT3504; - at least one of MT3600 and MT3601; - at least one of MT4111, MT4112; - MT4599. **Note** The total number of MT 3000-level and 4000-level credits may be reduced to no less than 90 with the permission of the Director of Teaching. **Other Information:** In total (between the two Schools) 240 credits are normally required at Level 3 and Level 4 of which at least 90 credits must be achieved at Level 4.
(B.Sc. Honours): **Mathematics with French^ or German^ or Russian^** ^ available also as 'With Integrated Year Abroad Degrees' **Not available to entrants from 2008-09** (M.A. Honours) **Mathematics with Russian^** or **Spanish^**	**Mathematics element of Major Degree with a Modern Language:** **Level 1:** 20 credits comprising MT1002 **Level 2:** 60 credits comprising passes at 11, or better, in MT2001 and one of MT2002 or MT2003 **Level 3 and level 4:** Normally a total of 180 credits which must include:- - at least two of MT3501, MT3503, MT3504; - at least one of MT3600 and MT3601; - at least one of MT4111, MT4112; - MT4599. **Other Information:** In total (between the two Schools) 240 credits are normally required at Level 3 and Level 4 of which at least 90 credits must be achieved at Level 4.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Mathematics with Geography**	**Mathematics element of Major Degree with a Modern Language:** **Level 1:** 20 credits comprising MT1002 **Level 2:** 60 credits comprising passes at 11, or better, in MT2001 and one of MT2002 or MT2003 **Level 3 and level 4:** Normally a total of 180 credits which must include:- - at least two of MT3501, MT3503, MT3504; - at least one of MT3600 and MT3601; - at least one of MT4111, MT4112; - MT4599. **Other Information:** In total (between the two Schools) 240 credits are normally required at Level 3 and Level 4 of which at least 90 credits must be achieved at Level 4.
(M.Phys. Honours): **Mathematics and Theoretical Physics**	**Mathematics element of Joint M.Phys. Degree:** **Level 1:** 20 credits comprising MT1002 **Level 2:** 60 credits comprising MT2001, at grade 15 or better, and one of MT2002 or MT2003 (Direct entry students to this programme who take MT1002 and MT2001 in their first year of study should normally take one of MT2002 and MT2003 in their second year of study.) **Level 3:** 30 credits comprising MT3501 and MT3504 **Level 4:** At least 45 credits comprising at least three 4000-level MT modules. **Level 5:** A project (either MT5999 or PH5102) together with a further 40 credits in 5000-level MT modules. **Note** Normally the Honours programme will comprise either 180 credits in MT modules at 3000 level and above, or 150 credits in MT modules at 3000 level and above together with a 30 credit MT module at 2000 level.
(B.Sc. or M.A. Honours): **Statistics**	**Single Honours Statistics Degrees:** **Level 1:** At least 20 credits including MT1002 **Level 2:** At least 60 credits including passes at 11, or better, in MT2001 and MT2004 **Level 3 and level 4:** - MT3501 - MT3606 - At least one of MT3607, MT4111, MT4112 - MT4606 - MT4607 - At least two of MT4531, MT4608, MT4609 - MT4599

(B.Sc. Honours): **Statistics and one of Computer Science, Economics, Geography, Internet Computer Science, Logic & Philosophy of Science, Management Science.** (M.A. Honours): **Statistics and one of Economics, Philosophy**	**Statistics element of Joint Honours Degrees:** **Level 1:** At least 20 credits including MT1002 **Level 2:** At least 60 credits comprising passes at 11, or better, in MT2001 and MT2004 **Level 3 and level 4:** Normally 120 credits which must include - 30 credits comprising MT3501, MT3606; - at least two from MT3706, MT4531, MT4606 - MT4609; - MT4599. **Other Information:** In total (between the two Schools) 240 credits are normally required at Level 3 and Level 4 of which at least 90 credits must be achieved at Level 4.

Students still completing degree programmes as defined in previous Course Catalogues should discuss their module selections with their Honours Adviser(s).

InterDisciplinary (ID) Modules

This School co-ordinates and contributes to InterDisciplinary module – **ID2003 Science Methods and also contributes to ID2004 Science Ethics.** (see Section 23)

Mathematics & Statistics (MT) Modules

MT1001 Introductory Mathematics

Credits: 20 Semester: 1

Prerequisites: Higher or A level Mathematics (A/S level Mathematics with approval of Head of School)

Anti-requisite: MT1003, CS1010

Description: This module is designed to give students a secure base in elementary calculus to allow them to tackle the mathematics needed in other sciences. Students wishing to do more mathematics will be given a good foundation from which they can proceed to MT1002. Some of the work covered is a revision and reinforcement of material in the Scottish Highers and many A-level syllabuses.

Class Hour: 9.00 am

Teaching: Five lectures, one tutorial and one laboratory.

Assessment: Continuous Assessment = 30%, 2 Hour Examination = 70%

Re-Assessment: 2 Hour Examination = 100%

MT1002 Mathematics

Credits: 20 Semester: Either

Prerequisites: MT1001 or B at Advanced Higher Mathematics or B at A level Mathematics

Description: This module is designed to introduce students to the ideas, methods and techniques which they will need for applying mathematics in the physical sciences or for taking the study of mathematics further. It aims to extend and enhance their skills in algebraic manipulation and in differential and integral calculus, to develop their geometric insight and their understanding of limiting processes, and to introduce them to complex numbers and matrices.

Class Hour: 9.00 am

Teaching: Five lectures, one tutorial and one laboratory.

Assessment: Continuous Assessment = 30%, 2 Hour Examination = 70%

Re-Assessment: 2 Hour Examination = 100%

MT1003 Pure and Applied Mathematics

Credits: 20 Semester: 2

Prerequisite: MT1002

Description: The aim of this module is to provide students with a taste of both pure and applied mathematics, to give them insight into areas available for study in later years and to provide them with the opportunity to broaden their mathematical experience.

Class Hour: 9.00 am

Teaching: Five lectures, one tutorial and one laboratory.

Assessment: Continuous Assessment = 30%, 2 Hour Examination = 70%

Re-Assessment: 2 Hour Examination = 100%

MT1007 Statistics in Practice

Credits: 20 Semester: 2

Prerequisites: An A grade at GCSE/Grade 1 at Standard Grade Mathematics or a C grade at AS level/Higher Mathematics

Description: This module provides an introduction to statistical reasoning, elementary but powerful statistical methodologies, and real world applications of statistics. Case studies, such as building an optimal stock portfolio, and data vignettes are used throughout the module to motivate and demonstrate the principles. Students get hands-on experience exploring data for patterns and interesting anomalies as well as experience using modern statistical software to fit statistical models to data.

Class Hour: 11.00 am

Teaching: Four lectures, one tutorial and one laboratory.

Assessment: Continuous Assessment = 50%, 2 Hour Examination = 50%

Re-Assessment: Continuous Assessment = 25%, 2 Hour Examination = 75%

MT1008 Mathematical Information Technology

Credits: 20 Semester: 1

Prerequisites: Higher or A-level Mathematics

Antirequisites: IS1003, CS1003, MT1006

Description: This module provides an introduction to the use of Information Technology in Mathematical Science. The topics covered include basic IT skills, data handling and analysis, and the use of a computational algebra package such as MAPLE. Students will undertake small projects and present short written reports. No previous knowledge of computing is required.

Class Hour: 11.00 am

Teaching: Four lectures, one tutorial and one laboratory.

Assessment: Continuous Assessment = 100%

Re-Assessment: Resubmission of appropriate project work and/or resit of class test(s)

MT2001 Mathematics

Credits: 30 Semester: Either

Prerequisite: MT1002

Anti-requisite: MT2101

Description: The aims of this module are to extend the knowledge and skills gained by students in the module Mathematics MT1002, and in particular to enhance their skills in the theory and application of: differential and integral calculus of several real variables; limiting processes; linear mathematics.

Class Hour: 12.00 noon

Teaching: Five lectures, one tutorial and one practical.

Assessment: Continuous Assessment = 30%, 3 Hour Examination = 70%

Re-Assessment: 3 Hour Examination = 100%

MT2002 Algebra and Analysis

Credits: 30 Semester: 1

Prerequisite: MT1002

Description: The aims of this module are to encourage students' understanding of the logical structure of mathematics and the nature of proof, and to introduce students to some fundamental concepts of abstract algebra and of analysis.

Class Hour: 11.00 am

Teaching: Five lectures, one tutorial and one practical.

Assessment: Continuous Assessment = 30%, 3 Hour Examination = 70%

Re-Assessment: 3 Hour Examination = 100%

MT2003 Applied Mathematics

Credits: 30 Semester: 2

Prerequisite: MT1002, MT2001

Anti-requisite: MT2101

Description: This module introduces students to applied mathematics through the construction, analysis and interpretation of mathematical models, and to the techniques of analysis used in mathematical modelling.

Class Hour: 12.00 noon

Teaching: Five lectures, one tutorial and one practical.

Assessment: Continuous Assessment = 30%, 3 Hour Examination = 70%

Re-Assessment: 3 Hour Examination = 100%

MT2004 Statistics

Credits: 30 Semester: 2

Prerequisite: MT1002

Description: This module introduces students to the mathematical models of randomness used as part of statistical modelling and analysis. The module is a mix of fundamental mathematical statistics and applied statistical analysis and provides the background necessary for the 3000 level modules in statistics.

Class Hour: 10.00 am

Teaching: Five lectures, one tutorial and one practical.

Assessment: Continuous Assessment = 30%, 3 Hour Examination = 70%

Re-Assessment: 3 Hour Examination = 100%

MT2005 Discrete Mathematics: Algorithms and Applications

Credits: 30 Semester: 2

Prerequisites: MT1002 or IS1003 or MT1008

Description: In recent years mathematics of discrete (finite) structures has greatly gained importance, especially with the development and expansion of computer technology. This module covers a selection of topics from discrete mathematics. The emphasis is on methods (algorithms) for manipulating finite mathematical objects (such as graphs, codes, abstract machines, etc.), solving problems using these algorithms, as well as on 'real life' applications of these methods to problems in operational research. The module also gives a mathematical treatment of computational machines (automata and Turing machines) and safe transfer of information (coding and encryption).

Class Hour: 11.00 am

Teaching: Five lectures, one tutorial and one practical.

Assessment: Continuous Assessment = 30%, 3 Hour Examination = 70%

Re-Assessment: 3 Hour Examination = 100%

The details of the Honours modules – that is 3000-level, 4000-level and 5000-level modules – which relate to the programmes listed in this section, are available in the Honours Course Catalogue.