Department of Mathematics and Statistics

UNDERGRADUATE HANDBOOK SUPPLEMENT

For Students entering Year 1 of our courses in 2020/21
This Handbook has two aims:

- to give you the information you need about Year 1 of the Department of Mathematics and Statistics degree courses;
- to offer advice on how to get the best out of your chosen course.

It covers the structure of Year 1 of the degree courses, how we teach and how you should learn, examinations and assessment, how to express your views to us and to ask us for help.

See also the University Student Handbook, the Department’s Student Handbook and the University web pages.

THE DEPARTMENT’S WEB SITE

Information about the Department is also provided on-line at:

strath.ac.uk/science/mathematicsstatistics

The site also contains links to pages for individual classes and other useful information.
The contents of this Handbook Supplement are, as far as possible, up to
date and accurate at the date of publication. The web links quoted were
available on 26/08/2020.

Changes and restrictions are, however, made from time to time and the
University reserves the right to add to, amend, or withdraw classes, courses
and facilities, to restrict student numbers and to make any other alterations
as it may deem desirable and necessary. Changes are published by
incorporation in the next edition of the University Calendar:

strath.ac.uk/studywithus/academicregulations

Staff who have special responsibilities are identified. These should be
your first port of call.

* * * * * *

**CALENDAR OF DATES**  2020/2021

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Monday, 14th September 2020 --- Friday, 18th December 2020</th>
</tr>
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<td>Teaching</td>
<td>Monday, 21st September --- Friday, 4th December</td>
</tr>
<tr>
<td>Examinations</td>
<td>Monday, 7th December --- Friday, 18th December</td>
</tr>
<tr>
<td>Vacation</td>
<td>Monday, 21st December --- Friday, 8th January 2021</td>
</tr>
<tr>
<td><strong>Semester 2</strong></td>
<td>Monday, 11th January 2021 --- Friday, 21st May 2021</td>
</tr>
<tr>
<td>Teaching</td>
<td>Monday, 18th January --- Friday, 2nd April</td>
</tr>
<tr>
<td>Vacation</td>
<td>Monday, 5th April --- Friday, 16th April</td>
</tr>
<tr>
<td>Examinations</td>
<td>Monday, 19th April --- Friday, 21st May</td>
</tr>
</tbody>
</table>
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</tbody>
</table>
Contact Information

Departmental Office

Should you need to contact us by mail or telephone, the address and telephone numbers are:

**Department of Mathematics and Statistics**  
**University of Strathclyde**  
**Room LT916**  
**Livingstone Tower**  
**26 Richmond Street**  
**Glasgow, G1 1XH.**  

**Telephone:** 0141 548 3804  
**Email:** contact-mathematics@strath.ac.uk

Key Staff Contacts 2020/2021

There are around 40 full-time members of staff in the department. All have offices in the Livingstone Tower on levels 8, 9 or 10. You can find a complete list of contact details on the Department's web pages. The office location, telephone extension and email address of some of the key staff are listed below.

If you have a problem or request, it is usually best to speak first with a class lecturer or your Personal Development Adviser. The Department's Administrator or secretarial staff can also deal with many routine enquiries.

**Year 1 Coordinator**  
Dr Peter Davidson  
LT1036  
3658  
peter.davidson@strath.ac.uk

**Head of Department**  
Prof John MacKenzie  
LT1009  
3668  
j.a.mackenzie@strath.ac.uk

**Academic Director**  
Dr Penny Davies  
LT1034  
3416  
penny.davies@strath.ac.uk

**Department Administrator**  
Ms Sandra Miller  
LT914  
3598  
s.j.miller@strath.ac.uk

All members of staff can be contacted on the University's internal phone system with the given extension. From off campus, these numbers should be prefixed by (0141) 548.
Joint Degree Contacts

The departmental offices for students on joint degree courses are located as follows.

Computer & Information Sciences: Livingstone Tower, Level 11

Mathematics, Science & Technological Education (a Division of the School of Education): Lord Hope Building, Level 5

Physics: John Anderson Building, Level 8

Accounting & Finance: Stenhouse Wing, Business School, Level 3

Economics: Duncan Wing, Business School, Level 5

Management Science: Duncan Wing, Business School, Level 7

Should you need to contact someone from these departments, then please use one of the following contacts. All joint degree enquiries, however, should be addressed to the Mathematics and Statistics Year 1 Coordinator in the first instance.

BSc in Mathematics & Computer Science/ BSc in Data Analytics
Ms I. Ross Computer & Information Sciences 3422

BSc in Mathematics & Physics
Dr A. Yao Physics 3175

BSc in Mathematics with Teaching
Mr J. Winter MSTE 8099

BSc in Mathematics, Statistics and Business Analysis
Mr K. Koutsouradis Management Science 3612

BSc in Mathematics, Statistics and Accounting
Ms J. Thamm Accounting & Finance 3889

BSc in Mathematics, Statistics and Economics
Dr L. McInally Economics 2910

BSc in Mathematics, Statistics and Finance
Ms J. Thamm Accounting & Finance 3889
Getting Started

This year, the Welcome and Development Week starts on Monday, 14th September. Details of some of the key events are listed below. Lectures and other classes start on Monday, 21st September. By the end of welcome week you should have a good idea of where and when your classes will be held, but please note that the University timetable is a little complicated to understand at first so do make sure you are well informed before classes start.

The two key dates for your diary are Tuesday 15th and Wednesday 16th September.

Faculty Welcome Address

A welcome address, recorded by Prof Debra Willison (Professor of Learning and Teaching for the Faculty of Science) can be found on the MM1: Maths & Stats First Year Myplace page:

classes.myplace.strath.ac.uk/course/view.php?id=16270

Student Card

Student cards are currently not being produced for new students. You do not need your card to access the library – please download the Strathclyde App or visit the kiosk at the library entrance. You will be emailed when card production starts. Make sure you upload your photo during registration.

Department Induction

Details of the Department’s events are given below.

Tuesday, 15th September: Live Q&A session (conducted via Zoom) with the Year 1 Coordinator.

Wednesday, 16th September: Meeting with your Personal Development Adviser.

The timings of these events will be emailed to you. Please ensure that you are checking your University email account on a regular basis.
Lectures

All courses start during the week commencing Monday, 21st September. The following planned approach is subject to the University’s priorities within the Scottish Government’s Covid-19 Route Map. The first three weeks will be presented predominantly online. Following this initial stage, the expectation is that we will then transition to a blended learning mode of delivery, over a three to five week period, with degree programme timing and arrangements made depending upon priorities, discipline, level of study and requirements.

Personal Development Adviser

All students are allocated a Personal Development Adviser (PDA). Your PDA will be a member of academic staff in the Department and will be a key contact for you throughout your undergraduate degree. The principal role of the PDA is to help ensure that your progress through your university studies is as free of problems and difficulties as possible. Briefly, you will meet your PDA at the start of each session, and again later in the session. If, however, you are worried about anything at all, do not wait: go and speak to your PDA. If he or she is not able to answer your questions immediately, then rest assured that your PDA knows someone who can. In your initial meeting on September 17th your PDA will help you choose a suitable elective.

Remember that your PDA is someone to whom you may turn for counsel and help on any problem, whether academic or personal. Students who are experiencing difficulty with their work, who feel that unreasonable demands are being made of them, or who find that they are being hindered by medical, domestic, financial, or other problems, should consult their PDA (or some other member of the academic staff) as soon as possible. Experience shows that problems that seem very serious can often be resolved if discussed at an early stage. Your PDA will treat anything you say as confidential unless you mutually agree to do otherwise.

The University’s Student Support and Wellbeing Service represents a network of staff able to provide expert help and counselling on any problem whether academic, personal or financial. More information about the support and services on offer can be found at the following website: strath.ac.uk/professionalservices/sees
First Year Curricula 2020-2021

Introduction

The curriculum for each course is made up of

1. Compulsory Classes;
2. Optional Classes, chosen from a list of classes;
3. Elective Classes, chosen from any of the classes offered in the University.

The full timetable for all classes in the University can be found at strath.ac.uk/timetables. You can have a look at this yourself, but it can be tricky to interpret. Guidance on your timetable will be provided during the Induction Week. You can always ask your PDA for advice.

Procedure to follow

Study the regulations giving the first year curriculum for your chosen course carefully. See pages 16 - 24. Syllabus details for all appropriate first year Mathematics and Statistics classes are provided on our website with a summary on pages 25 - 30. A list of popular elective classes is provided separately. This gives information on classes that are not run by the Department of Mathematics and Statistics. Syllabus details of compulsory classes for joint degree courses are available from the University Class Catalogue classcat.strath.ac.uk or the parent department that runs the class.

You need to choose classes amounting to no fewer than 120 credits. In first year, most of these classes are compulsory. You will also need to choose 10 or 20 credits for elective classes. These may be chosen from any other classes on offer within the University that fit your timetable subject to you satisfying any necessary prerequisites.

If you think that you may wish to transfer to a different degree course then it is a good idea to use your choice of elective and optional classes to ease this. For example, if you are registered for Mathematics but still wish to retain the option of studying Mathematics, Statistics & Economics then you should include EC111 Introduction to Economics (total 20 credits) as your elective class. At your interview on Wednesday, 16th September, your PDA will check over your proposed curriculum/timetable and advise you as necessary. Changes to your curriculum (optional and elective classes) may be made within the first two weeks of the Semester. You are advised to contact the Year Coordinator to make these changes.
Elective Classes

Classes that were studied by our students as electives recently included:
Accountancy, Chemical Engineering, Economics, Electronics, English, Entrepreneurship, Finance, History, Law, Business Analysis, Mechanical Engineering, Modern Languages, Politics and Psychology as well as other Science Faculty classes.

Note that the Mathematics & Statistics 10 credit classes MM106, MM107, MM108, MM109, MM123 and MM124 may be chosen as electives if not already compulsory for your course. Classes MM106 and MM107 cover the first and second semesters, respectively, of MM104, while MM123 and MM124 cover the first and second halves, respectively, of the second semester class MM103.

Education Classes

Note that the education component in the Mathematics with Teaching degree course does not start until Year 4. In the first two years the curriculum is identical to that for the BSc in Mathematics. If you wish to transfer to the joint degree in Mathematics with Teaching then you must seek advice from staff in the School of Education’s Department of Curriculum Studies: Mathematics, Science and Technological Education Division before submitting such a request. Strict quotas place limits on the number of Mathematics with Teaching places available. The co-ordinator for the joint degree is John Winter (contact details on page 6). Transfer to the joint degree course must be approved before the start of Year 3.

To enter an Initial Teacher Education course in Scotland you are required to have a pass in the SQA Higher English, or equivalent.

You will also have to undergo Medical Screening during the course. Furthermore, School Experience and Registration with the General Teaching Council for Scotland (GTCS) also requires that you have not had any convictions that might prejudice your involvement with children, and to this effect you must be a member of the Protection of Vulnerable Groups scheme.

[Note that a student wishing to enter the teaching profession may alternatively take the year-long Professional Graduate Diploma in Education (Secondary) once they have gained an undergraduate degree.]
BSc in Mathematics, Statistics and Accounting

This degree course may lead to a fully accredited accounting qualification provided that the following classes, amounting to 40 credits, are studied and passed: EC111 Introduction to Economics and AG105 Introduction to Finance and Financial Statistics. Although you do not need to take these classes for the degree they are advisable if you wish to become a Chartered Accountant. It is also best to take these classes in your first year. Taking these classes leads to exemptions from examinations set by the Institute of Accountants while studying to be a Chartered Accountant after graduating. Note there are further optional classes that should be taken in later years to give you an accredited degree.

It is NOT possible to transfer into this degree course after the start of the session due to its high entry requirements and accredited classes.

BSc Honours

All first year BSc students are initially enrolled on the Honours programme (a four year degree). To progress on this degree into second year you must reach a minimum standard performance, namely a credit weighted average (CWA) in your exams of 40% and passes in both MM101 and MM102. If you fail to meet this standard you will be transferred to the 3 year pass degree.

MMath in Mathematics

The MMath is an Integrated Masters degree, also called an enhanced undergraduate degree, and corresponds to the 4-year MMath degrees offered in England and Wales and therefore takes one more year than a BSc Honours degree. Note that progress requirements for the MMath are much higher (CWA over 60%). As the curriculum in the early years is the same as that for the BSc in Mathematics, a student performing very well may transfer from the BSc to the MMath course.
Transfer between Undergraduate Courses

The opportunities that exist to transfer between undergraduate degree courses occur primarily at the beginning, in the middle and at the end of your first year and at the end of your second year. Transfer possibilities naturally become more limited as time passes although transfer to the single subject course in Mathematics (or Mathematics and Statistics from Year 4) is sometimes possible right up to the start of the final year.

If, at any stage, you are considering changing your degree course then you should consult with your PDA and/or Adviser of Studies responsible for your current course as soon as possible, however tentative your plans may be, and with the Departmental Academic Director for the degree course to which you propose to transfer; he or she will advise you on the feasibility of such a transfer and whether or not it would appear to be in your best interests. See also the Department’s Student Handbook.

First Year Students Changing Course

A first-year student wishing to change to another course should, if the course is within Strathclyde, follow the procedure outlined above. For Scottish students supported by SAAS, funding for an additional year’s study may be available under the “plus one” rule. Students from outwith Scotland are advised to contact their equivalent funding authority. Contact the Student Financial Support Team (located in the Advice Centre in the McCance Building, email: finance-helpdesk@strath.ac.uk) for further details.

Part-Time Study

Students may study for the BSc in Mathematics, the BSc in Mathematics and Physics, or the BSc in Mathematics, Statistics and Economics on a part-time basis. Note that the first two years of the BSc in Mathematics with Teaching may also be studied on a part-time basis. If full-time study proves too much it is possible to apply to transfer to one of the above courses rather than leave the University. Contact your Adviser of Study for advice.

Voluntary Withdraw from Studies

If a student wishes to withdraw from a course of study after discussion with their PDA or Adviser of Studies, the student must write to the University formally to notify them of their decision.
Attendance at Classes

You will find that the atmosphere at University is probably more relaxed than that at your previous school or college. You should be aware that the University (General Regulations 00001.UG.1.24-27) and the Student Awards Agency for Scotland (SAAS) or your Local Education Authority (LEA) require you to be here and attend classes - you must be here during semesters and only compelling mitigating circumstances can excuse absence from classes. Staff responsible for each class will monitor attendance as appropriate. It is a student's responsibility to ensure that their attendance has been noted. The Head of Department (or Nominee) can report an unsatisfactory attendance record to the Science Faculty Board of Study, which, in certain circumstances, may result in a report being sent to the SAAS or your LEA.

Additionally, students are required to perform satisfactorily the work of the class. Where laboratory work is an integral part of a class it is clearly important to attend regularly and to complete the scheme of work required. In some classes the award of the credit is dependent upon satisfactory coursework being carried out in addition to the written examination being passed. Any student whose attendance or performance has not been satisfactory may be deemed 'Not Qualified' to sit the examination and hence disqualified from the degree examination in the class concerned.

Additional work will normally be required in order for a Not Qualified student to be reinstated for a subsequent attempt at a degree examination.

Your Responsibility as a Student

As a student we expect you to attend classes in a respectful manner (for example, make sure you arrive promptly and turn off your phone); carry out assignments and submit them timeously; observe good conduct at all times and treat your fellow students with consideration; use the University facilities (computers, library, etc.) responsibly; inform us of changes in your address; and spend an appropriate amount of time on private study (including lectures and other classes, the average student should expect to spend around 40 hours a week studying). Above all a key responsibility is to make the best of the learning opportunities that you are afforded in the University, progress successfully through your course and graduate with a degree that is a true reflection of your ability.
Feedback to Students

The Department of Mathematics and Statistics recognises the value to students of feedback and is therefore committed to providing timely and appropriate feedback. To get the best out of feedback you need to be actively engaged in your studies. Feedback is only helpful if the information/comments are used by yourself to improve your future performance. Through feedback you should learn from your mistakes and misconceptions and build on achievements.

Feedback will help you identify gaps in your understanding and enable you to seek help and clarification when you need it. Individual advice can be obtained at the tutorial/problems class. Alternatively, you can arrange to consult your lecturer/tutor. Staff will endeavour to return within 15 days, during the teaching period, work you submit on time. In many classes this will be within a week.

Feedback may take many forms, e.g.

(i) Written or oral comments on work submitted
(ii) The supply of model solutions in class or via Myplace
(iii) Grading of submitted work (normally in conjunction with (ii)).

Feedback on examinations may be given by providing a generic commentary on students’ performance (identifying common strengths and weaknesses) along with comments on those parts of questions that need particular attention.

Termination

A student who persistently does not attend classes may be reported to the Board of Study and may have their registration terminated and be required to withdraw from their course (See Regulation 00001.UG.1.52). In the Faculty of Science the criteria for reporting shall be: Non-attendance at all of the classes in the student’s registered curriculum taking place at the time for a period of 5 weeks without a medical certificate or other explanation being submitted to your PDA, Year Coordinator, Department, Adviser of Studies or Student Business - Science.
Student- Staff Liaison Committee

The Faculty Board of Study, which is the University committee that manages Science Faculty business, has student representatives. They change from time to time, but the Faculty Manager can tell you who the current representatives are. The Department of Mathematics and Statistics also has a Departmental Student-Staff Committee with representatives from each year of study. Minutes are kept of its actions and these are available on Myplace. The results of these actions are scrutinised at Departmental Meetings and the Faculty of Science Academic Administration Committee. The committee is formed in October from willing volunteers. The members are listed on Departmental notice boards and may be contacted by email or through Myplace.

The line of student-staff communication may be defined as follows:

- Issues of student concern associated with particular classes (including individual student difficulties) should in the first instance be raised with the lecturer in charge. If these issues cannot be resolved, students should then communicate their concern to the appropriate Year Coordinator. Unresolved issues should then be raised at the Student-Staff Committee meetings and, as a last stage, students may take particular issues to the Head of Department.
- Issues concerning the organisation of a particular year of a course or the operation of an entire course in general should be raised directly with the appropriate Year Coordinator. Once again, unresolved issues should then be communicated in the Student-Staff Committee meetings and ultimately to the Head of Department.
Year 1 Course Regulations

Course regulations are to be read in conjunction with Regulation 00001.UG, a selection of whose content is given below.

00001.UG General Regulations for the Degree of Integrated Masters, Degree of Bachelor with Honours, Degree of Bachelor, Diploma of Higher Education and Certificate of Higher Education

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00001.UG.1.4 Modes of Study
Courses are offered on a full-time and/or part-time basis except where indicated to the contrary in the course regulations. At the discretion of the relevant Board of Study on the recommendation of the relevant Course Director (or nominee), a student may transfer from full-time to part-time study and vice-versa where an appropriate course is available, at which time the relevant minimum and maximum periods of study will be reviewed.

.....

00001.UG.1.43 Progress of Students
To progress to the second year of a chosen course a student must have accumulated a minimum of 20 credits fewer than the total number of credits specified by the course curriculum at first year.

.....

00001.UG.1.49 A student studying on a part-time basis must satisfy the appropriate progress requirements following each period of the equivalent full time credit load. More detailed progress regulations may be specified in individual course regulations.

00001.UG.1.50 A student studying on a part-time basis shall not normally proceed to the next year of study with more than 20 credits outstanding.

00001.UG.1.51 A student who meets the criteria for progress from one academic year to another may not necessarily be eligible for an award.

.....

Award
00001.UG.1.78 To be awarded a Certificate of Higher Education a student must have accumulated no fewer than 120 credits with at least 100 credits at Level 1.
Mathematics

MMath in Mathematics, MMath in Mathematics and Statistics
BSc (with Honours) in Mathematics
BSc (with Honours) in Mathematics and Statistics
BSc (with Honours) in Mathematics with Teaching
Diploma/Certificate of Higher Education in Mathematical Studies

Curriculum (Full-time study)
First Year
12305.UG.1 All full-time students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM103 Geometry and Algebra with Applications</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM104 Statistics and Data Presentation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM108 Applying Mathematics 1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>MM109 Applying Mathematics 2</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Curriculum (Part-time study)

12305.UG.6 Students studying on a part-time basis will normally take classes amounting to 60 credits in each year.

Progress
12305.UG.7 To progress to the second year of either the MMath or Bachelor with Honours degrees in addition to satisfying the requirements of Regulation 00001.UG.1.43 students must gain passes in *MM 101 Introduction to Calculus* and *MM 102 Applications of Calculus*.
12305.UG.8 To progress to second year of the Bachelor degree Regulation 00001.UG.1.43 shall apply.

Progress (Part-time study)
12305.UG.13 Regulations 00001.UG.1.49 and 00001.UG.1.50 shall apply.

Award
12305.UG.24 Certificate of Higher Education in Mathematical Studies: Regulation 00001.UG.1.78 shall apply.
Mathematics and Computer Science

BSc (with Honours) in Mathematics and Computer Science
Diploma/Certificate of Higher Education in Mathematics and Computer Science

Mode of Study
12305.UG.54 The courses are available by full-time study.

Curriculum
First Year
12305.UG.55 All full-time students shall undertake classes amounting to 130 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM106 Essential Statistics</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>MM123 Geometry and Algebra</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>CS103 Machines, Languages and Computation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>CS104 Information and Information System</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>CS105 Programming Foundations</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Progress
12305.UG.59 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 student must also gain passes in the following classes: MM 101 Introduction to Calculus and MM 102 Applications of Calculus.

12305.UG.60 In order to progress to the second year of the Bachelors course Regulation 00001.UG.1.43 shall apply.

Award
12305.UG.68 Certificate of Higher Education: In order to qualify for the award of a Certificate of Higher Education in Mathematics and Computer Science Regulation 00001.UG.1.78 shall apply.
Mathematics and Physics

BSc (with Honours) in Mathematics and Physics
Diploma/Certificate of Higher Education in Maths and Physics

Curriculum (Full-time study)
First Year
12305.UG.100 Students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM106 Essential Statistics</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>MM123 Geometry and Algebra</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>PH180 Experimental Physics</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>PH183 Mechanics, Optics and Waves</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>PH184 Quantum Physics and Electromagnetism</td>
<td>1</td>
<td>20</td>
</tr>
</tbody>
</table>

Curriculum (Part-time study)
12305.UG.104 Students studying on a part-time basis will normally take classes amounting to 60/70 credits in each year.

Progress
12305.UG.105 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 student must also gain passes in the following classes: MM 101 Introduction to Calculus and MM 102 Applications of Calculus.

12305.UG.106 In order to progress to the second year of the Bachelors course Regulation 00001.UG.1.43 shall apply.

Progress (Part-time study)
112305.UG.110 Regulations 00001.UG.1.49 and 00001.UG.1.50 shall apply.

Award
112305.UG.116 Certificate of Higher Education: In order to qualify for the award of a Certificate of Higher Education in Mathematics and Physics Regulation 00001.UG.1.78 shall apply.
Mathematics, Statistics and Accounting

BSc (with Honours) in Mathematics, Statistics and Accounting
Certificate/Diploma of Higher Education in Mathematical Studies

Status of the Courses
12305.UG.148 All students are normally admitted in the first instance as Honours students. Transfer to BSc in Mathematics, Statistics and Accounting is possible at any time subject to satisfying the appropriate progress regulations. Students wishing to obtain professional accreditation in Accounting should consult the Adviser of Study (Accounting) regarding their choice of optional classes. To be eligible for accreditation students will require to take an additional 20 credit class.

Mode of Study
12305.UG.149 The courses are available by full-time study.

Curriculum
First Year
12305.UG.150 All full-time students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM103 Geometry and Algebra with Applications</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM104 Statistics and Data Presentation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>AG111 Accounting Technologies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Additional Optional Class
Students seeking professional accreditation in Accounting must additionally take the class
AG105 Introduction to Finance and Financial Statistics 1 20

Progress
12305.UG.154 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 student must also gain passes in the following classes: MM 101 Introduction to Calculus, MM 102 Applications of Calculus and AG 111 Accounting Technologies.

12305.UG.155 In order to progress to the second year of the Bachelors course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following class: AG 111 Accounting Technologies.

Award
12305.UG.164 Certificate of Higher Education: In order to qualify for the award of a Certificate of Higher Education in Mathematical Studies Regulation 00001.UG.1.78 shall apply.
Mathematics, Statistics and Economics

BSc (with Honours) in Mathematics, Statistics and Economics
Certificate/Diploma of Higher Education in Mathematical Studies

Curriculum (Full-time study)
First Year
12305.UG.196 All full-time students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM103 Geometry and Algebra with Applications</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM104 Statistics and Data Presentation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>EC111 Introduction to Economics</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Curriculum (Part-time study)
12305.UG.200 Students studying on a part-time basis will normally take classes amounting to 60 credits in each year.

Progress
12305.UG.201 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following classes: MM 101 Introduction to Calculus, MM 102 Applications of Calculus and EC 111 Introduction to Economics.
12305.UG.202 In order to progress to the second year of the Bachelors course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following class: EC 111 Introduction to Economics.

Progress (Part-time study)
12305.UG.206 Regulations 00001.UG.1.49 and 00001.UG.1.50 shall apply.

Award
12305.UG.212 Certificate of Higher Education: In order to qualify for the award of a Certificate of Higher Education in Mathematical Studies Regulation 00001.UG.1.78 shall apply.
Mathematics, Statistics and Finance

BSc (with Honours) in Mathematics, Statistics and Finance
Certificate/Diploma of Higher Education in Mathematical Studies

Mode of Study
12305.UG.244 The courses are available by full-time study only.

Curriculum
First Year
12305.UG.244 All students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
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<td>20</td>
</tr>
<tr>
<td>MM103 Geometry and Algebra with Applications</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM104 Statistics and Data Presentation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>AG151 Introduction to Finance and Accounting</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Progress
12305.UG.249 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following classes: MM 101 Introduction to Calculus, MM 102 Applications of Calculus and AG 151 Introduction to Finance and Accounting.

12305.UG.250 In order to progress to the second year of the Bachelors course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following class: AG 151 Introduction to Finance and Accounting.

Award
12305.UG.259 **Certificate of Higher Education:** In order to qualify for the award of a Certificate of Higher Education in Mathematical Studies Regulation 00001.UG.1.78 shall apply.
Mathematics, Statistics and Business Analysis

BSc (with Honours) in Maths, Statistics and Business Analysis
Certificate/Diploma of Higher Education in Mathematical Studies

Mode of Study
12305.UG.291 The courses are available by full-time study only.

Curriculum
First Year
12305.UG.292 All students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM103 Geometry and Algebra with Applications</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM104 Statistics and Data Presentation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MS112 Business Analysis and Technology</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Elective Class(es)</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Progress
12305.UG.296 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following classes: MM 101 Introduction to Calculus, MM 102 Applications of Calculus and MS 112 Business Analysis and Technology.

12305.UG.297 In order to progress to the second year of the Bachelors in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following class: MS 112 Business Analysis and Technology.

Award
12305.UG.306 **Certificate of Higher Education:** In order to qualify for the award of a Certificate of Higher Education in Mathematical Studies Regulation 00001.UG.1.78 shall apply.
Data Analytics

BSc (with Honours) in Data Analytics
Certificate/Diploma of Higher Education in Data Analytics

Mode of Study
12305.UG.338 The courses are available by full-time study.

Curriculum
First Year
12305.UG.339 All students shall undertake classes amounting to 120 credits as follows:

<table>
<thead>
<tr>
<th>Compulsory Classes</th>
<th>Level</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM101 Introduction to Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM102 Applications of Calculus</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>MM106 Essential Statistics</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>MM123 Geometry and Algebra</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>CS103 Machines, Languages and Computation</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>CS104 Information and Information Systems</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>CS105 Programming Foundations</td>
<td>1</td>
<td>20</td>
</tr>
</tbody>
</table>

Progress
12305.UG.343 In order to progress to the second year of the Honours course in addition to satisfying the requirements of Regulation 00001.UG.1.43 a student must also gain a pass in the following classes: MM 101 Introduction to Calculus and MM 102 Applications of Calculus.
12305.UG.344 In order to progress to the second year of the Bachelors course Regulation 00001.UG.1.43 shall apply.

Award
12305.UG.352 Certificate of Higher Education: In order to qualify for the award of a Certificate of Higher Education in Data Analytics Regulation 00001.UG.1.78 shall apply.
Class Code: MM101
Class Title: Introduction to Calculus

Level: 1
Credits: 20

Class Coordinator: Dr P. Knight
Tel: 3818
Email: p.a.knight@strath.ac.uk

Teaching Staff: Dr P. Knight & Dr D. Pritchard

Pre-requisites: Essential: SQA Higher Mathematics (Grade A) or equivalent (including confidence in algebraic manipulation, arithmetic and elementary trigonometry).

Students: Compulsory: M, MS, MT, MSA, MSE, MSF, MSBA, MP, MCS, DA

CLASS DELIVERY (HOURS)

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>LABORATORIES</th>
<th>ASSIGNMENTS</th>
<th>SELF STUDY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>11</td>
<td>0</td>
<td>33</td>
<td>90</td>
<td>200</td>
</tr>
</tbody>
</table>

CLASS ASSESSMENT
Course work (20%), 2 hour degree examination (80%) in January. August resit examination (100%).

GENERAL AIMS
To study the basic concepts and standard methods of mathematical notation and proof, polynomial equations and inequalities, sequences and series, functions, limits and continuity, differentiation and integration.

LEARNING OUTCOMES
On completion of this class, the student should
- be able to understand and use correctly basic mathematical notation;
- be able to write mathematical arguments in a clear and concise way;
- understand the concept of mathematical proof by induction and other methods;
- be able to solve linear and quadratic equations and inequalities;
- be able to apply polynomial division and use the remainder theorem;
- know the factorial and binomial coefficient notation, and be able to use the binomial theorem;
- understand the concepts of a sequence and a series, and be able to do simple problems on finite and infinite summation;
- understand the concept of a function, its domain and its range;
- be able to apply all the standard rules of differentiation to find first and higher derivatives;
- be able to find integrals using substitutions and integration by parts; and
- be familiar with trigonometric functions and their inverses, exponentials, logarithms, and be able to evaluate derivatives and integrals of such functions.

RECOMMENDED TEXT/READING


Full syllabus: classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138936&show=all
**Class Code:** MM102  
**Class Title:** Applications of Calculus

**Level:** 1  
**Credits:** 20

**Class Coordinator:** Dr M. Langer  
**Tel:** 3821  
**Email:** m.langer@strath.ac.uk

**Teaching Staff:** Dr M. Langer & Dr S. Kitaev

**Pre-requisites:** Essential: MM101 or equivalent

**Students:** Compulsory: M, MS, MT, MSA, MSE, MSB, MP, MCS, DA

<table>
<thead>
<tr>
<th>CLASS DELIVERY (HOURS)</th>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>LABORATORIES</th>
<th>ASSIGNMENTS</th>
<th>SELF STUDY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>44</td>
<td>10</td>
<td>0</td>
<td>30</td>
<td>116</td>
<td>200</td>
</tr>
</tbody>
</table>

**CLASS ASSESSMENT**

Course work (20%), 2 hour degree examination (80%) in May/June. August resit examination (100%).

**GENERAL AIMS**

The fundamental concepts of calculus (differentiation and integration) presented in MM101 will be examined in more detail, extended to a larger class of functions by means of more sophisticated methods, including an introduction to complex numbers and variables, all demonstrated in application to practical problems including solving basic first and second-order differential equations.

**LEARNING OUTCOMES**

On completion of this class, the student should

- be able to calculate derivatives of functions that are given implicitly or parametrically;
- be able to compute linear and polynomial approximations of functions;
- be able to construct Taylor polynomials;
- be able to sketch simple curves;
- be able to solve elementary max/min and related rate problems;
- be able to integrate functions using various substitutions and integration by parts;
- be able to compute the volume and surface area of bodies of revolution and the arc length of a plane curve;
- be familiar with complex variables in both Cartesian and polar forms;
- be able to carry out complex arithmetic operations, find roots, factorize polynomials and derive trigonometric identities;
- be able to solve some basic first and second order differential equations; and
- be able to identify solution properties of certain ODEs using the graph of the right-hand side function.

**RECOMMENDED TEXT/READING**


**Full syllabus:** classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138421&show=all
Class Code: MM103
Class Title: Geometry and Algebra with Applications
Level: 1
Credits: 20
Class Coordinator: Dr P. Davidson
Tel: 3658
Email: peter.davidson@strath.ac.uk
Teaching Staff: Dr P. Davies & Dr K. Tant

Pre-requisites: Essential: SQA Higher Mathematics (Grade B) or equivalent

Students: Compulsory: M, MS, MT, MSA, MSE, MSF, MSBA

CLASS DELIVERY (HOURS)

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>LABORATORIES</th>
<th>ASSIGNMENTS</th>
<th>SELF STUDY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>145</td>
<td>200</td>
</tr>
</tbody>
</table>

CLASS ASSESSMENT

Course work (20%), 2 hour degree examination (80%) in May/June. August resit examination (100%).

GENERAL AIMS

To give an introductory treatment of vectors and matrices, and to introduce the idea of mathematical modelling through their application to real-world problems.

LEARNING OUTCOMES

On completion of this class, the student should
- appreciate the interconnectedness of geometry and algebra;
- describe operations needed to transform congruent shapes into each other both algebraically and geometrically;
- use and manipulate vectors and matrices algebraically and geometrically;
- understand when matrices can be added or multiplied together;
- write any straight line in implicit, vector or (where possible) explicit form and convert between the three;
- convert between vector and Hessian forms of planes;
- solve simple problems involving straight lines and planes (e.g., intersection points, and angles) making use of distance and section formulae where appropriate;
- be familiar with the algebraic definition of conic sections to find and sketch key features;
- apply and invert affine transformations to vectors to understand their geometric effects;
- find affine transformations to map between any two given triangles;
- understand the concept of a linear transformation and appreciate that a linear transformation can be decomposed into certain basic mappings;
- generalise geometric concepts in 2D to 3D;
- understand the concept of a mathematical model and be able to interpret problems in a mathematical way, and appreciate the significance of modelling for real-world applications;
- formulate and solve problems involving difference and differential equations (for example in population modelling, heat conduction, and motion under gravity); and
- formulate and solve optimisation problems with constraints.

RECOMMENDED TEXT/READING


Full syllabus: classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138422&show=all
Class Code: MM104
Class Title: Statistics and Data Presentation

Level: 1
Credits: 20

Class Coordinator: Prof C. Robertson
Tel: 2975 Email: johnathan.love@strath.ac.uk

Teaching Staff: Prof C. Robertson & Dr A. Miller

Pre-requisites: Essential: SQA Higher Mathematics (Grade B) or equivalent

Students: Compulsory: M, MS, MT, MSA, MSE, MSF, MSBA

<table>
<thead>
<tr>
<th>CLASS DELIVERY (HOURS)</th>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>LABORATORIES</th>
<th>ASSIGNMENTS</th>
<th>SELF STUDY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>120</td>
<td>200</td>
</tr>
</tbody>
</table>

CLASS ASSESSMENT
Course work (100%). August resit examination (100%).

GENERAL AIMS
To present some basic ideas and techniques of statistics while introducing some essential study skills, allowing students to develop and practice personal and technical skills (e.g. self study, teamwork, analysing data, writing reports and making presentations).

LEARNING OUTCOMES
On completion of this class, the student should
- be able to summarise and display data in an appropriate fashion;
- understand and be able to apply the laws of probability;
- be able to use sampling distributions, z- and t- tests and calculate confidence intervals using these statistics;
- be able to fit and interpret a simple linear regression model and understand correlation;
- know how to structure a statistical report;
- be able to prepare good quality reports using Word and/or LaTeX;
- be able to use Excel to make calculations using formulae, to analyse data and to produce suitable graphical and tabular representations of data;
- be confident with presenting results orally; and
- be able to work effectively as part of a team.

RECOMMENDED TEXT/READING
Veitch, R., Introduction to Statistics, University of Strathclyde.

Full syllabus: classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138798&show=all
Class Code: MM108  
Class Title: Applying Mathematics 1

Level: 1  
Credits: 10

Class Coordinator: Dr A. Sonnet  
Tel: 3648  
Email: andre.sonnet@strath.ac.uk

Teaching Staff: Dr A. Sonnet

Pre-requisites: Essential: SQA Higher Mathematics (Grade B) or equivalent

Students: Compulsory: M, MS, MT

<table>
<thead>
<tr>
<th>CLASS DELIVERY (HOURS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECTURES</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

CLASS ASSESSMENT
Course work (20%), degree examination (80%) in December. August resit examination (100%).

GENERAL AIMS
To introduce students to some elementary number theory with interesting modern applications.

LEARNING OUTCOMES
On completion of this class, the student should

- be able to factorise integers and find highest common factors and lowest common multiples;
- be able to use the Euclidean algorithm;
- know the basic properties of congruences and be able to perform calculations using modular arithmetic;
- be familiar with the application of congruences to International Standard Book Numbers and Universal Product Codes;
- be able to solve Diophantine equations and linear equations in $\mathbb{Z}_n$; and
- understand what is meant by affine ciphers, exponential ciphers and the RSA cryptosystem.

RECOMMENDED TEXT/READING

Full syllabus: classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138938&show=all
Class Code: MM109  
Class Title: Applying Mathematics 2

Level: 1  
Credits: 10

Class Coordinator: Dr D. Bevan  
Tel: 4535  
Email: david.bevan@strath.ac.uk

Teaching Staff: Dr D. Bevan

Pre-requisites: Essential: SQA Higher Mathematics (Grade B) or equivalent

Students: Compulsory: M, MS, MT

<table>
<thead>
<tr>
<th>CLASS DELIVERY (HOURS)</th>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>LABORATORIES</th>
<th>ASSIGNMENTS</th>
<th>SELF STUDY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>5</td>
<td>0</td>
<td>30</td>
<td>45</td>
<td>100</td>
</tr>
</tbody>
</table>

| CLASS ASSESSMENT | | |
|------------------|| |
| Course work (20%), degree examination (80%) in May. August resit examination (100%). |

| GENERAL AIMS | | |
|-------------|| |
| To introduce students to areas of mathematics not usually met in school or college courses. |

| LEARNING OUTCOMES | | |
|-------------------|| |
| On completion of this class, the student should |
| • understand the mathematical concepts of graphs; |
| • understand how to solve mathematical problems using graphs; |
| • be able to construct graphs with given degree patterns; |
| • be able to identify Eulerian graphs and, in simple cases, Hamiltonian graphs. |

| RECOMMENDED TEXT/READING | | |
|--------------------------|| |

| Full syllabus: | | |
|---------------|| |
| classcat.strath.ac.uk/classcatalogue/control/showclass?uiocode=138430&show=all |