

Mathematics
& Statistics

Lancaster
University



Part II Undergraduate Handbook 2021-2022



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Last updated: 07 October 2021.

Whilst every effort has been made to ensure that the information contained in this document is accurate, details are subject to change.

Term Dates

Academic Year 2020-2021:

Michaelmas Term: 8 October 2021 to 17 December 2021 (Welcome Week: 4 October 2021)

Lent Term: 10 January 2022 to 20 March 2022

Summer Term: 17 April 2022 to 26 June 2022

Exam Periods

All Part II exams occur during the Summer Term (Weeks 21 – 30). Typically, they occur between Weeks 23 and 28. NOTE: exams may be scheduled on a Saturday.

Points of Contact

Academic Staff

The following is a list of key members of academic staff who are relevant to Part II undergraduate students. Also, each student is allocated an Academic Advisor who will hold termly interviews; see Page 10 for more about Academic Advisors.

Part II BSc Director of Studies: Dr Jonathan Evans,
E-mail: j.d.evans@lancaster.ac.uk

Part II MSci Director of Studies: Dr Dirk Zeindler
E-mail: d.zeindler@lancaster.ac.uk

Part II FST Director of Studies: Dr Yemon Choi
E-mail: y.choi1@lancaster.ac.uk

Part II Non FST Director of Studies: Dr Azadeh Khaleghi
E-mail: a.khaleghi@lancaster.ac.uk

Head of Department: Professor Alexander Belton
E-mail: a.belton@lancaster.ac.uk

Director of Undergraduate Teaching: Dr Mark MacDonald
E-mail: m.macdonald@lancaster.ac.uk

Study Abroad Director: Dr Yemon Choi
E-mail: y.choi1@lancaster.ac.uk

Placement Director: Dr David Paukztello
E-mail: d.paukztello@lancaster.ac.uk

Academic Employability Champion: Dr David Paukztello
E-mail: d.paukztello@lancaster.ac.uk

Academic Employability Champion - Deputy: Dr Clement Lee
E-mail: clement.lee@lancaster.ac.uk

Disability Officer: Dr Sean Prendiville
E-mail: s.prendiville@lancaster.ac.uk

Assessment Officer: Dr Daniel Elton
E-mail: d.m.elton@lancaster.ac.uk

Administrative Office Support

All Enquiries: [**mathsteaching@lancaster.ac.uk**](mailto:mathsteaching@lancaster.ac.uk)

The **Teaching Office** is open for general enquiries, Room B02/B03, Fylde Building.

E-mail: mathsteaching@lancaster.ac.uk

Teaching Coordinator (Part II): Callum Forsyth

E-mail: c.forsyth@lancaster.ac.uk

Student Programmes Officer: Amy Pearson

E-mail: a.pearson6@lancaster.ac.uk

Departmental Administrator: Catherine Winterburn

E-mail: c.winterburn@lancaster.ac.uk

Noticeboard for class information etc. in the area of the homework pigeonholes Fylde Building.

Web pages for information about the Department can be found on the [maths web page](#).

Module information/timetables can be found in [My Area of Student Portal](#)

[**Online Courses Handbook**](#)

General Information

Information and advice which applies to all Lancaster undergraduates can be found on the [undergraduate core information webpage](#).

What follows below is information which is particularly relevant to Part II students in the Department of Mathematics and Statistics.

Teaching Model

Most courses will have the following components:

- Frontal teaching.
The course consists of 20 lectures and 5 workshops. The lectures are the main method of transmitting the content and is also your main point of contact with the module lecturer. Workshops take place in small groups, each one under the supervision of a tutor and are used to practice the course content
- Flipped classroom.
The course consists of pre-prepared material (such as pre-recorded video lectures and/or written notes), 10 lectures and 5 workshops. The main method of transmitting the content is the pre-prepared material. You will get list of what material you have to read and/or watch ahead of each lecture. The lectures are intended to help you understand the content through examples and discussion. The lecturer will not be presenting the pre-prepared material again in the lectures. Thus you should engage fully with the pre-prepared material in order to get anything out of the lectures. Workshops take place in small groups, each one under the supervision of a tutor and are used to practice the course content.

The module lecturer of each module decides which teaching method is used. Further, most modules run over 5 or 10 weeks. An exception is Math240.

Attendance

We believe that attendance at these timetabled events (both in-person and online) is an important part of your learning journey. Your attendance and coursework submission will be monitored, and if we are concerned about your academic progress, then we may contact you. If you are absent for a legitimate reason, then please let us know; for example, you can self-certify your absences online. The instructions on how to do this can be found [here](#).

Module Resources

All module resources can be found on the [moodle page](#) of each course. This includes course notes, exercise sheets, a bibliography and, if available, R-files and pre-recorded videos.

Course notes and exercises sheets are provided in PDF format. In some cases, notes are also available in HTML format. If required by your ILSP, we will provide you with a set of printed notes.

Coursework

Most modules have a coursework component. The deadlines, number of courseworks as well as the weighting may vary between different modules. The coursework can consist of one or more of the following components.

- Written coursework to be submitted via Moodle.

This can be handwritten or be created by LaTeX (or any other typesetting system). Handwritten work can be scanned for submission using Microsoft Lens, or equivalent software. Solutions should be clearly written and clearly scanned, and work which is unclear or difficult to mark may be penalised or may even be rejected. Your grades and feedback will be made available to you electronically when your tutor has marked your work.

- Written coursework to be submitted via coursework pigeonholes.

The pigeonholes for this purpose are opposite B4c in the Mathematics and Statistics department. Solutions should be clearly written, and each page should have your name at the top. Work which is unclear or difficult to mark may be penalised or may even be rejected. The tutor will return the marked assignments at the tutorial or workshop, together with any feedback.

- Moodle quizzes

These are computer-assessed coursework questions and can be found on the Moodle page of the corresponding course. These may include multiple choice questions, drag & drop questions, numerical questions, and many more. The deadlines for these quizzes are displayed on each module's Moodle pages.

- Individual or group projects

Projects normally run over several weeks. The aim of a project is to produce a report and/or a presentation. The reports should typically be written in LaTeX or in R-Markdown and may have also an R component. Work will normally be returned to you within 4 weeks of submission excluding university closure periods.

It is expected that the students give at end of the coursework an honest and complete account of who helped them with the coursework and all other resources they used (books, websites, etc). Moodle quizzes are typically excluded. Further, it is recommended to look at the section plagiarism framework in this handbook.

Students benefit from attempting more questions than those strictly required: it is only by trying to do Mathematics that one learns it. The problems presuppose acquaintance with the material covered in lectures and/or pre-prepared material.

Tutorials/workshops

Tutorial or workshop groups will consist of about 15 students, and each group has a tutor. This tutor is typically also responsible for marking written assignments of this tutorial/workshop. The tutor will give in this tutorial/workshop in particular comments on the assignments. These may include comments on individual or common errors, but also on the clarity, understandability and accuracy of the presentation of the tasks.

Late coursework

The Lecturer will state the deadline before which coursework should be submitted. Work submitted up to three days late without an agreed extension will receive a penalty of 10%, and additionally the mark will be capped at 70%. Saturdays and Sundays are included as days in this regulation. However, when the third day falls on a Saturday or Sunday, students will have until 10.00 a.m. on Monday to hand in work without receiving further penalty. Work submitted more than three days late without an agreed extension will be awarded a zero and will be considered a non-submission.

The lecturer will state when the solutions will be available to students, and due to the desire to provide prompt feedback, that may fall within the three-day period. In which case, late coursework will be awarded a zero if it is submitted after the solutions have been published.

For projects and other pieces of coursework that are given letter grades, the late penalty will be as described by university regulations, which usually means a reduction of one full letter grade (see MARP GR 2.3.4).

Fairness is one of the main principles that justifies our policy on late coursework.

Books

Although lectures are intended to contain all the material required, you should use textbooks to supplement your understanding and to see alternative presentations of the subject matter.

A list of recommend books can be found in the resource list on the moodle page of the corresponding module. Many books are available as ebook and copies of

most of the relevant books are available from the University Library; where a book proves to be popular, multiple copies are kept. Most Mathematics and Statistics books are in the AQN section on A floor; some texts are kept in the Short Loan Section. The online library catalogue is available at the [library web page](#).

Calculators during examinations

For those Mathematics and Statistics examinations where the use of calculators is permitted, you will be issued with a standard Casio FX-85GT PLUS Scientific Calculator for the duration of the examination; this will be provided in the examination venue, and is not to be removed. If you would like to familiarise yourself with this model, sample calculators may be tried out in the Teaching office. Personal calculators are not permitted for Mathematics and Statistics examinations, but may be used for other assessments during the year including end-of-module tests (as long as calculators are allowed).

Exceptional Circumstances

If you are ill, or have some other good reason for missing a single coursework, or a small amount of class time, you should let your Academic Advisor, Director of Studies or the Teaching Office know promptly. Absences should also be logged online (using the Absence Notification link in the Online Student Services section of your Student Portal).

You need to make a claim for exceptional circumstances if you want the Department to take into account any illness or other good reason which has resulted in you missing a significant amount of coursework or an examination, or if you feel your performance in coursework or an examination has been negatively affected by adverse circumstances.

Claims for exceptional circumstances need to be supported by appropriate evidence. For a medical condition affecting performance this will normally mean a report completed by an appropriate professional who should comment on how the medical condition concerned would be likely to have affected your ability to prepare for or carry out the assessment(s) in question. Medical certificates that merely confirm attendance at a clinic are unlikely to be considered sufficient. The Assessment Officer can provide advice about exceptional circumstances and what evidence might be appropriate.

Claims for exceptional circumstances, together with appropriate supporting evidence, should be submitted to the Teaching Office. This should be done as early as possible and certainly by the end of the examinations period in May/June.

All cases will be reviewed by the Exceptional Circumstances Committee. In cases where good cause has been demonstrated the Committee may propose a number of actions as appropriate to the case. Examples of such actions include the extension of a deadline, or the opportunity to resit an examination or coursework as if it were a first attempt (for which there will be no fee and the marks will not be capped). However students should note that it is not possible to change the marks obtained for any assessment.

Exceptional circumstances are generally not an appropriate means to deal with chronic medical issues or other relevant long-standing personal circumstances. Such cases are better handled via appropriate support arrangements, such as an integrated learning plan (ILSP) or alternative assessment arrangements.

If you would like to apply for exceptional circumstances, please complete the [exceptional circumstances form](#) and return it to the student office.

Academic Advisor

Every student is assigned to an academic advisor for the duration of their degree. The academic advisor is there to support the academic development of a student. Your advisor can

- discuss and advise you on your academic progress,
- help you make decisions in relation to your courses,
- answer questions about your studies and other services at Lancaster University,
- discuss your career plans with you,
- help you with module choices,
- write recommendation letters and
- signpost you to services available elsewhere in the university.

Your academic advisor will arrange a meeting with you in intro-week of your first year, and termly thereafter. They are also available for consultation on any academic problems that might arise in connection with your courses. This can be for instance choice of modules, absence, illness, difficulty with work etc. Note that an academic advisor is neither a well-being officer nor a counsellor. If you have mental health problems such as depressions, we recommend to contact the [Counselling and Mental Health Service](#) at Lancaster University. You can contact them at counselling@lancaster.ac.uk or +44 (0)1524 592690.

If you are unsure who your academic advisor is, then just ask any member of the administrative staff, and they will be happy to let you know.

Independent Learning

It is very important to recognise that timetabled teaching forms only a small part of your work at the University. Your overall workload for the year is expected to be around 1200 hours – this includes not only formal teaching hours but also time spent on other activities including self-directed reading, checking your understanding of what you have been taught, undertaking assignments, revision for tests and exams, etc. Over the thirty weeks of term-time this should average about 40 hours per week – the equivalent of a full-time job. It is your responsibility to organise your working time accordingly.

Video recording of lectures

Although individual lecturers may choose to have their lectures recorded, this will be done on a case-by-case basis. The department's Undergraduate Teaching Committee believes there are reasons for not recording lectures by default. A lecture should be an interactive event, which demands input from both lecturer and students, and not a passive experience.

Computing

Several Part II modules in Mathematics and Statistics have associated Computer Laboratory classes and assessment linked to these. Wherever possible the software is open source and students are expected to download it onto their own machines.

Lab A1 (Engineering) is often used for the department laboratory classes, and for individual use when available. Postgraduate students have access to labs in the PSC. There are also several general access computer laboratories available on campus for student use. Computing advice is provided by ISS.

Information on the internet

Useful information, such as timetables, previous examination papers and coursework marks are available online, on the [Student Registry website](#).

You will need your username and password to access your personal information. There is also a wide variety of useful links on the [Current Students web page](#).

Moodle

Moodle provides activities and resources to support your learning. Lecturers utilise Moodle in a wide variety of ways to deliver learning materials (handouts, presentations, bibliographies etc), engage you in active learning (exercises and

online tests, discussion spaces and learning logs) and update you with information about your modules.

iLancaster

iLancaster App provides an alternative link into Moodle when on the move, together with other useful information and advice. It is also used for checking-in to lectures and workshops. If you are not able to check-in using the iLancaster App then you are required to sign a register at your workshop. More information can be found on the [iLancaster web page](#).

Communication by e-mail

Your Lancaster email address will be used for all official correspondence from the University. You are expected to check it on a daily basis during term time.

Awards

Second Year Prizes

The *Lloyd Prize in Mathematics* is awarded each year for the best performance by a second year undergraduate who is reading mathematics as a major subject, either alone or in combination with another major subject. The prize consists of books to the value of c. £60.

The *Striding Edge Scholarship* is an award of £500 available for a 2nd year Mathematics (single or combined) major student who is experiencing some financial hardship, and who has obtained a first class result at the end of Year 1. The award is made on the basis of academic achievement in Year 2. Any student who wishes to be considered for this award should contact the Teaching Office or their Director of Studies before the 31st May of their 2nd year.

Final Year Prizes

The *David Astley Memorial Prize* is awarded to that undergraduate reading for a degree in mathematics with honours, who at the end of his/her final year is judged to have displayed the best combination of breadth of mathematical abilities with clarity of exposition. This prize is now donated by the Department and has been given to the value of £100.

The *IMA Prizes* are 2 prizes to be awarded to students that have demonstrated outstanding performance in their mathematics course. This can be in their final year or over the whole qualification. The prizes give a year's free membership of the Institute.

The *Royal Statistical Society Prize* is awarded to the best statistician graduate. The prize is one year's graduate statistician membership of the Royal Statistical Society.

The *Amelia Carney Memorial Prize* is awarded to the graduating student reading for a joint degree in Computer Science and Mathematics with honours, who is judged to have displayed the best overall academic performance throughout their degree.

Lancaster Award

At Lancaster we not only value your academic accomplishments, but also recognise the importance of those activities you engage with outside your programme of study. The student experience is enhanced by including extra-curricular activities and, with more graduates than ever before and increasing competition for jobs upon leaving University, these are vital to your future prospects. We want to encourage you to make the very most of your University experience and to leave Lancaster as a well-rounded graduate. We have a wealth

of opportunities to get involved in with initiatives such as work placements, volunteering, extracurricular courses, societies and sports. The Lancaster Award aims to encourage you to complete such activities, help you to pull them together in one place and then be recognised for your accomplishments. We want you to stand out from the crowd - the Lancaster Award will help you to do this. For more information see the [Lancaster Award website](#).

Module Enrolment

In October when you arrive, and each subsequent year (normally in April/May) you will be asked to enrol for the individual courses or modules which make up your programme of study. Enrolment will be available online, and you will be advised by email, from Student Registry, when enrolment is available. Manual enrolments can be made via the Directors of Studies and the Teaching Office.

There will be a one hour timetabled advice session towards the end of the Lent Term, primarily for Year 2 students regarding their Year 3 choices. Also you can ask your Academic Advisor or your Director of Studies regarding your academic module options.

Changing your Major or your Modules

You may change your intended major subject at Part II enrolment to any major for which your Part I subjects qualify you. However, any changes are reliant on your achieving a majorable mark in any subject you wish to take as a major. You are still permitted to change your major (Part I subjects and results permitting) at any time before the start of your second year.

If you decide to change your major before Part II enrolment in May you need to discuss this with the department(s) involved and then enrol in the normal way. If you decide after you have enrolled for Part II courses (for example, on receipt of examination results) then you should contact the Student Registry as soon as possible after you receive your results.

Please seek advice from your Director of Studies or the Teaching Office.

Changes in Part II enrolment will only be accepted in the first two weeks of the course module for normal 5 or 10 week modules, and during the first two days for short intensive statistics modules.

You can download a change of major form, or a change of enrolment form, from the [registry website](#).

Online Courses Handbook

The [online courses handbook](#) provides information on all taught undergraduate and postgraduate programmes of study and course modules in any one academic year. This includes syllabuses and pre-requisites.

Student support and representation

Lancaster has adopted a student-centred approach in which access to high quality support across a range of areas is provided by different agencies in a way which best meets each student's individual circumstances and needs. This is summarised in the [Student Support Policy](#).

In addition, during the first year of study, you will be assigned to a named College Advisor. That person can also provide advice and support to you on accessing these services, or upon any other issues you may need help with.

The university also has an academic advisor system where you will be allocated an academic advisor within your major department who will meet with you on a one to one basis each term. This advisor will be interested in and be knowledgeable about your progress and be in a position to provide academic advice and support.

Student Representatives

Student representatives are elected from each year to act as representative of Mathematics and Statistics students. The representatives have the right to attend **Department meetings**, and generally advise the Department of any student concerns. There is one meeting per term.

The **staff-student consultative committee** comprises the student Year Representatives, an MSc representative, a postgraduate, the Directors of Studies and the Directors of Undergraduate and Postgraduate Teaching. The committee considers any teaching issues which are raised at the meeting. Meetings are chaired by a postgraduate student, and are usually held in the weeks 3, 8, 13, 18 and 23.

Student Feedback

At the end of each module you will be emailed and asked to provide feedback through an online questionnaire. This feedback is then used by us in a number of ways, all of which contribute to our processes for assuring the quality of our teaching. These processes include:-

- Consideration by your module organisers and teaching staff when reviewing their courses at the end of the year and planning future developments. The Head of Department also receives and reviews summaries of all module feedback.
- Discussion at the department's teaching and staff-student committees to identify module strengths and weaknesses, develop proposals for module refinement.

- Analysis within the department's annual teaching report to identify examples of good practice and areas for improvement; this report is discussed at faculty and university teaching committees.
- Module evaluations are uploaded to Moodle, and lecturers respond accordingly.

The NSS is a survey of mostly final year undergraduates in England, Northern Ireland, Wales and the majority of institutions in Scotland. FE colleges with directly funded HE students (i.e. students in their final year of a course leading to undergraduate qualifications or credits) in England and Wales will also participate. The survey is part of the revised system of quality assurance for higher education, which replaces subject review by the QAA, and is designed to run alongside the QAA institutional audit to generate more detailed public information about teaching quality. [Ipsos MORI](#), an independent research company, administers the survey.

Students' Charter

Central to the mission of Lancaster University is a strong and productive partnership between students and staff. The University and Lancaster University Students' Union have worked together on a [Students' Charter](#) to articulate this relationship and the standards to which the University and its students aspire.

Assessment and feedback code of practice

The Quality Assurance Agency for Higher Education defines the following terms:

- Formative assessment has a developmental purpose and is designed to help learners learn more effectively by giving them feedback on their performance and on how it can be improved and/or maintained.
- Summative assessment is used to indicate the extent of a learner's success in meeting the assessment criteria used to gauge the intended learning outcomes of a module or programme.

The summer examinations are the main summative assessments used in our department. Weekly homework is partially summative, since it counts towards the final grade, but for most modules it should be considered as primarily formative assessment.

In this section we set out a code of good practice regarding undergraduate assessment and feedback within the Department of Mathematics and Statistics at Lancaster University. Below "lecturer" refers to the course convenor of a given module, "tutor" refers to anyone who is grading work for that module, and "student" refers to anyone enrolled in that module.

Responsibilities of the lecturer

1. The lecturer should communicate to the students at the start of the module how their final grade will be calculated. The proportion of the grade which comes from coursework, projects, exams, etc., should be stated in the LUSI module catalogue.
2. Lecturers should ensure their formative assessment is designed to promote learning and improve understanding.
3. For weekly assignments, and other multi-question work, the lecturer is expected to state how many marks are allocated to each question well before the due date.
4. For projects, and other student work that is not purely quantitative, it is important for the lecturer to communicate to the students how they will be graded well before the due date.
5. Once any piece of formative work has been collected, the lecturer should provide the students with model solutions and/or a marking scheme before or shortly after the students are given back their graded work. It is also preferable that solutions and/or marking schemes are made available on Moodle.
6. The lecturer should provide their tutors with a marking scheme for any assessed work, to ensure that student work can be graded consistently. It is sometimes sufficient to assign partial marks for individual steps on the model solutions.

7. The lecturer is responsible for resolving any grading inconsistencies between tutors which are brought to their attention.
8. If any inaccuracies are discovered in the model solutions or marking scheme, then the lecturer should promptly distribute a corrected version.
9. When setting the final examination, lecturers should ensure they are assessing the learning outcomes of the module, as they have been stated to the students.

Responsibilities of the tutors

1. Tutors should be familiar with the document "*Guidelines for tutors*" (available on the shared drive).
2. Tutors are expected to grade work in a timely manner. In particular, weekly coursework should be graded before the weekly workshops, and project feedback should be given to the students within 4 weeks of submission.
3. Tutors should learn and understand the marking scheme and/or guidelines given to them by the lecturer.
4. When giving feedback, tutors should encourage critical reflection by the student.

Responsibilities of the students

1. Students should learn how they are being assessed in each module.
2. Solutions are expected to hand clearly written and clearly scanned coursework.
3. Students are expected to consider all feedback given to them by their tutors. If any piece of feedback is unclear, then the student should seek further explanation from their tutor.
4. If grading inconsistencies between students are discovered, then these should be brought to the attention of their tutors. If the issue cannot be resolved after consulting the marking scheme, then it should be brought to the attention of the lecturer.
5. Students are expected to complete an anonymous module evaluation at the end of each module, which provides feedback to the lecturer and the department.

Guidelines for marking schemes

It is important that any summative or formative assessment be consistent and fair between tutors within a module.

- **Written Coursework:**

These assignments are graded based on their mathematical and notational correctness, but may also be partially graded on their precision of expression, or presentation. Lecturers and tutors may differ in their grading practices. So, in the interests of transparency and fairness, it is recommended that lecturers produce marking schemes and/or grading

guidelines for all coursework, so that both the students and the tutors know how work should be graded.

For example, an otherwise correct answer which incorrectly uses a certain piece of mathematical notation may or may not be penalized. Also, the extent to which partial marks are awarded for incorrect answers may differ between lecturers. The purpose of a marking scheme is to clarify these ambiguities.

- **Examinations:**

For most modules in our department, the main summative assessment is the examination in summer term. No feedback is given on these examinations, and neither the solutions nor the marking schemes are made public. Past examination papers from previous years (without solutions) can be found on the Student Registry website.

The weighting of the exam is different in most modules. You can find these weightings in the section *Module Descriptions* and also in the LUSI online courses handbook for details of individual modules.

The exam marks are moderated by undertaking a comparative analysis of marking trends to compare individual students' marks on an individual course with their average mark on all their other courses. If you wish to be informed on any aspect of the regulations regarding exams, please consult Student Registry in University House.

- **Projects and dissertations:**

Our department offers several modules which, as part of their assessment, include written projects. Students can be requested to use LaTeX or R-Markdown for coursework or projects. Exceptions to this are those students who have not taken MATH240. If that is the case, please inform the lecturer. Like all assessment, it is important that the students are informed of the marking scheme well before the due date. Projects are usually graded with letter grades, and it is often not possible to give a precise numerical grade breakdown. Nevertheless, in the interests of transparency and fairness, it is recommended that the lecturer indicates specific criteria considered during grading.

The following are the project marking guidelines, which are intended to ensure consistency of project grading across the department. The lecturer should specify a set of categories on which the assessment will be based, and the weighting given to each category. Categories can include, for example, Content and Understanding, Organisation and Style, Initiative, etc. For shorter projects, a single category is appropriate. Within each category the lecturer should state specific learning outcomes. A category should be awarded the appropriate letter grade if it meets the requirements of the corresponding descriptor in the table below; if the

descriptor is met but there is particular strength or weakness, a plus or minus should be appended. The overall grade is given by the weighted average of the aggregate scores corresponding to the letter grades in each category.

A Grades

- Letter grade: **A+** 24 / **A** 21 / **A-** 18
- Description: Exemplary range and depth of attainment of intended learning outcomes, secured by discriminating command of a comprehensive range of relevant materials and analyses, and by deployment of considered judgement relating to key issues, concepts and procedures.

B Grades

- Letter grade to aggregate score: **B+** 17 / **B** 16 / **B-** 15
- Description: Conclusive attainment of virtually all intended learning outcomes, clearly grounded on a close familiarity with a wide range of supporting evidence, constructively utilised to reveal appreciable depth of understanding.

C Grades

- Letter grade to aggregate score: **C+** 14 / **C** 13 / **C-** 12
- Description: Clear attainment of most of the intended learning outcomes, some more securely grasped than others, resting on a circumscribed range of evidence and displaying a variable depth of understanding.

D Grades

- Letter grade to aggregate score: **D+** 11 / **D** 10 / **D-** 9
- Description: Acceptable attainment of intended learning outcomes, displaying a qualified familiarity with a minimally sufficient range of relevant materials, and a grasp of the analytical issues and concepts which is generally reasonable, albeit insecure.

Marginal Fail

- Letter grade to aggregate score: **F1** 7
- Description: Attainment deficient in respect of specific intended learning outcomes, with mixed evidence as to the depth of knowledge and weak deployment of arguments or deficient manipulations.

Fail

- Letter grade to aggregate score: **F2** 4

- Description: Attainment of intended learning outcomes appreciably deficient in critical respects, lacking secure basis in relevant factual and analytical dimensions.

Poor Fail

- Letter grade to aggregate score: **F3 2**
- Description: Attainment of intended learning outcomes appreciably deficient in respect of nearly all intended learning outcomes, with irrelevant use of materials and incomplete and flawed explanation.

Very Poor Fail

- Letter grade to aggregate score: **F4 0**
- Description: No convincing evidence of attainment of any intended learning outcomes, such treatment of the subject as is in evidence being directionless and fragmentary.

Presentations: Some modules, such as MATH240, include an oral presentation component. Presentations will be graded using some or all of the following assessment criteria.

An excellent academic presentation is one in which the following components are present.

- There is a clear structure (introduction, main body and conclusion) in which key themes are presented in a logical order.
- Information is accurately extracted and communicated, items for investigation are clearly identified and analysed, tangible conclusions are drawn and arguments are fully supported by relevant evidence or reference to theory.
- Visual material is accurate (no typographic, spelling or grammatical errors), effective in supporting the key messages of the presentation and not distracting.
- The words and terminology used are appropriate for an academic presentation.
- Body language and attitude are appropriate throughout the presentation.
- The pace is appropriate (not too fast and not too slow with appropriate use of pauses), voices are clear (pitch, tone and volume are used effectively to aid audience audibility, interest and understanding) and pronunciation of words and technical terms are correct and clear.

- If there are multiple presenters, then they support each other and do not interrupt others unnecessarily.
- Timing is used to good effect and time limits are not exceeded.

Data Protection in Student Projects

If as part of any student project you collect personal/sensitive data on living people which would identify them, you need to ensure you are compliant with the UK Data Protection Act 2018 and the EU General Data Protection Regulation (GDPR).

This means that you should gain consent from participants, only collect information needed for your project, handle and store all data securely and anonymously where possible and you should be informing participants of:

- Your study objectives
- How long you will retain their information
- How you will secure their data before it is anonymised or deleted
- How a participant could withdraw their data from the project
- An appropriate person to receive complaints, e.g. your supervisor

This should be part of your project design and you should discuss this with your supervisor.

Plagiarism Framework for Mathematics and Statistics

Plagiarism involves the unacknowledged use of someone else's work and passing it off as if it were one's own. This includes the following examples.

- Copying or paraphrasing from a source text without acknowledgement. This includes quoting text from a referenced source without distinguishing it with quotation marks or similar. It does not include the statement of standard results, definitions and so forth, which is permissible without attribution.
 - One single line or a few words. This will not usually be considered an issue.
 - A whole paragraph or more. This is in general a major offence.
 - Somewhat less, but several lines. This is poor academic practice and a minor offence.
- Submission of another student's work or a part thereof.
 - In the case of weekly coursework students are allowed to work together, but each student should write up separately and not submit the same work.
 - For a project or a dissertation it is a major offence.
- Directly copying from model solutions made available in previous years. This is taken very seriously as a major offence.
- Reproduction of the same or almost identical work for more than one assessment is, in general, a major offence.
- Submission of purchased work is a major offence.
- Copying computer code from the internet for project work is a *major offence*.

The level of intent will be taken into consideration; unintentional plagiarism is a minor offence. If there is no intent to gain an unfair advantage, then it is likely due to poor study skills, but the matter will usually still be raised with the student concerned.

Preventing plagiarism

All members of the department involved in teaching are expected to raise awareness and give advice on good study practice, while being clear about expected standards, including referencing and the use of quotations.

All markers are required to act if plagiarism is suspected. Graduate Teaching Assistants will consult the course lecturer on what action to take. The Academic Officer and the Heads of Undergraduate and Postgraduate Teaching can provide guidance if desired.

How suspected plagiarism is handled

In the case of a minor offence, marks will be deducted for poor academic practice and feedback will identify the problem. A meeting with the student will usually be offered, to discuss the matter. The Academic Practice and Support (APS) section of the student's LUSI record will be updated by a member of admin staff, to note that marks have been lost through poor academic practice. A copy of the relevant material will be passed to the Academic Officer. Students may appeal the judgement to the Academic Officer. Persistent offenders will be referred to their Director of Studies. Any suspected major offence must be referred to the Academic Officer, and no mark will be recorded until the case is resolved; copies will be made of the material which is under suspicion. The student will be informed that their mark is withheld and that they may appeal to the Academic Officer. An entry will be made in the APS section of the student's LUSI record to the effect that the case has been referred to the Academic Officer.

This advice is provided to give a better understanding of the university's [Plagiarism Framework](#).

Assessment regulations and degree classification

For Bachelor's degrees (BSc and BA), a student normally needs to have studied 360 credits over three years, with at least 90 credits at level 6 (that is, from third-year modules). Usually this will be composed of 120 credits from year one (Part I) and 120 credits from each of years two and three (Part II).

For integrated Master's degrees (MSci), a student normally needs to have studied 480 credits over four years, with at least 120 credits at level 7 (that is, fourth-year modules). Usually this will be composed of 120 credits from year one (Part I) and 120 credits from each of years two, three and four (Part II).

Only Part II credits contribute to the final degree classification. Each module contributes to the overall mean in proportion to the number of credits it is worth.

Aggregation score

In October 2011 the university implemented new undergraduate assessment regulations, which are now in place for all undergraduate students. These changes have been introduced to simplify the existing regulations, ensure markers use the full range of available marks across all disciplines and deal with mitigating circumstances in a more transparent way.

The main features are:-

- Assessed work which is quantitative will be marked in percentages. These marks will be converted to an aggregation score on a 24 point scale, as described in the table below.

Percentage	Aggregation Score
100	24
90	22.5
80	21
75	19.5
70	18
65	16.5
60	15
55	13.5
50	12
45	10.5
40	9
20	4.5

Aggregation Score	Letter grade	Classification
24	A+	First
21	A	First
18	A-	First
17	B+	Upper Second
16	B	Upper Second
15	B-	Upper Second
14	C+	Lower Second
13	C	Lower Second
12	C-	Lower Second
11	D+	Third
10	D	Third
9	D-	Third
7	F1	Fail
4	F2	Fail
2	F3	Fail
0	F4	Fail

- Some assessed work, such as project work, will be marked using letter grades. These grades will be converted to an aggregation score on a 24 point scale for the purposes of calculating your overall module results and your final degree class.
- Degree classifications will be based on your overall aggregation score and there will be clear definitions for borderline scores and departmental criteria for considering borderline cases.
- To progress between years, any failed modules must be resat. Only one resit opportunity is permitted.
- To qualify for a degree any modules which you have not passed must be condoned, that is you are given credit for taking them even though you have not achieved a pass mark. Failed module marks may only be condoned above a minimum aggregation score indicating a reasonable attempt has been made.
- To be awarded an honours degree, you must attain an overall pass grade and have no more than 30 credits condoned.
- The penalty for work submitted late is a reduction of one full grade for up to three days late and zero thereafter.

The [undergraduate assessment regulations](#) and a student FAQ with answers to the most common questions relating to how you are assessed and how your overall degree result will be determined go to:

Resits

A student who fails any module will have the opportunity of reassessment; for lecture modules, this normally involves taking a resit examination in the same academic year as the first attempt. For modules not in the student's final year, the maximum aggregation score that the student can gain by reassessment is 9. For modules in the student's final year, the reassessment will only be to gain sufficient credit to qualify for a degree.

Resits usually take place in August. Students are encouraged to contact lecturers over the summer to support during their revision, who will be happy to help. Be aware that out of term time some lecturers may not respond to emails promptly, so allow plenty of time for a response. In particular, we recommended that you contact lecturers at least two weeks before your exams.

When a student resits an examination, the department will submit a resit mark which is the maximum of:

- the original mark;
- the resit examination mark;
- the original coursework mark, with the resit examination mark.

A fee at a rate determined from time to time shall be payable by a student who is given permission to resit any examination or resubmission of dissertation.

In exceptional circumstances students may be allowed to take a re-sit exam as their first sitting with no fees applied. Such cases would include for example illness or family circumstances all would need appropriate signed written evidence.

Progression Requirements

In order to progress from Year 2 to Year 3 of a BA/BSc/MSci degree a student must achieve (following any opportunities for reassessment) an overall aggregation score of 9 or above with no more than 30 credits condoned.

If at the end of Year 3 a student enrolled in an **MSci** degree (excluding Study Abroad degrees) does not achieve the criteria for a 2.I BSc degree at the first sit, they will be automatically switched to a BSc degree, graduated, and will not be allowed to progress to Year 4.

If you are enrolled on a **Placement Year** or **Industry** degree scheme, and you failed to achieve a 14.5 average at the end of Year 2, then you might not be allowed to continue on your placement year, depending on your potential employer. In this case, you would be automatically transferred onto the corresponding BSc degree, and you would continue onto Year 3 the following year. If you do not manage to secure a placement or decide you no longer intend to take a placement year you will be transferred back onto the three year variant of your degree.

Students entering the third year on a **Study Abroad MSci** scheme are committed to the MSci from then on. If such a student wishes to change to a BSc, they are encouraged to contact the Study Abroad Director, who may be able to offer other options in exceptional cases.

Condonation

For students who entered Year 1 in 2015/16 or before, the examination board can condone up to 30 credits of failed modules for a classified 3 year degree, and up to 45 credits for a classified 4 year degree, but only if the student has taken reassessment and all of the aggregation scores in the failed modules are greater than or equal to 4 after reassessment.

For students who started in 2016/17 or after, the examination board can condone up to 30 credits of failed modules for a classified 3 year degree, and up to 45 credits for a classified 4 year degree, but only if the student has taken reassessment and all of the aggregation scores in the failed modules are greater than or equal to 7 after reassessment.

Some modules may be paired (to a maximum size of 30 credits) for the consideration of condonation. Pairing for condonation information can be found in [Appendix 6 of the Undergraduate Assessment MARP regulations](#).

Examinations

For most modules without a project component or a major coursework component, the examination in summer makes up between 70% and 90% of the grade. For modules with a project or a major coursework component, the examination in the summer usually accounts for between 50% and 70% of the grade. See the [online courses handbook](#) for details.

[Past examination papers](#) from previous years (without solutions) can be found online.

Model solutions are not provided to examinations, because we wish students to use their own initiative, to learn to work independently and to develop their skills in problem solving. Using your own understanding to produce a solution, assisted

by related examples from lecture notes, workshops and assessed exercises, is more valuable and develops mathematical insight far more than rote learning of a fixed method. If, despite your best efforts, the desired solution is still elusive, help may be sought from the lecturer, either during the relevant revision lecture, via email or by arranging a meeting.

Intercalations

Sometimes because of medical, financial or personal difficulties students feel they have no alternative but to apply to suspend their studies for a year. Whilst this option can be of benefit to some students, it is not without its drawbacks: one of the major ones being the fact that students are not permitted to claim benefits if they would normally be excluded under the full-time education rules. Intercalating students are regarded as continuing students on the grounds that they intend to resume their studies.

Don't allow yourself to drift into a situation that ends with intercalation being the only option, because without some assured financial support - a guaranteed job or financial help from your family - you could be left with no source of income.

Do ensure that you seek help early if you are experiencing any problems that may adversely affect your academic work. Speak to someone in the department or any of the various welfare agencies or call into [the Advice, Support and Knowledge \(ASK\) Service](#), part of Student Based Services, in University House, who will put you in touch with someone in the Student Registry if necessary.

If personal circumstances mean that you are left with no alternative but to seek a period of intercalation, please contact the ASK service and your Director of Studies to arrange to discuss your application.

Withdrawals

If you feel uncertain about carrying on at Lancaster, it is important that you talk it through with your Director of Studies or one of the other support services such as your personal College Advisor or someone in Student Based Services. Some initial [written advice is also available online](#). It may be, for example, that you need time to adjust to a new and unfamiliar lifestyle.

Should you decide to leave, it is essential that you do not just walk out. You should contact the Student Registry within Student Based Services who will discuss your plans with you and formally approve your withdrawal. The Student Registry will notify Student Finance England to have payment of your loan and tuition fees stopped, as appropriate. If you have any books on loan from the Library or are in possession of any university equipment or property, please make sure that you return these - it will save you and us a lot of unnecessary letters and telephone calls.

In order to safeguard your entitlement to funding for any future course you should seek advice as soon as possible. Full details on this, and information regarding a transfer to another course/college, may be obtained from the Student registry.

Repeated years or repeated courses

A widely held, but incorrect, belief is that you can repeat a year of study if you haven't done very well, repeat an individual course, or replace a course in which you have done badly with another one. This is not the case. Part II modules count towards your degree classification and it is University policy that no student shall be given an unfair advantage over fellow students through being allowed to automatically repeat individual modules, periods of study or a whole programme of study.

If a student's academic performance has been adversely affected by personal, health or financial problems and where such cases have been properly documented then this student can apply to repeat a year or a course. If you would like a repeat year to be considered, you should contact your director of studies and apply for exceptional circumstances, see the section on exceptional circumstances. Also you should arrange an appointment with a Student Adviser within Student Education Services via The ASK Service. A statement will be required and evidence, if applicable, to support the repeat period of study. The Student Adviser will then liaise with your Department and the Head of Student Registry, or nominee, and confirm an outcome. Please note that if a repeat year is granted, you will lose all credit, marks and grades gained in the original Part II year. If you have failed the year and would like to apply for a repeat a year, but have no exceptional circumstances then you have to appeal.

Degree Classification

At the end of the degree programme a student's overall mean will be calculated from their module aggregation scores taking into account the relative weightings (credit value) of the modules. That overall mean will then be rounded to one decimal place and be used to determine the class of degree to be awarded as follows:-

Percentage	Aggregation score	Degree class
68.3 to 100	17.5 to 24.0	First
67.0 to 68.0	17.1 to 17.4	Borderline
58.3 to 66.7	14.5 to 17.0	2.1
57.0 to 58.0	14.1 to 14.4	Borderline
48.3 to 56.7	11.5 to 14.0	2.2
47.0 to 48.0	11.1 to 11.4	Borderline
40.0 to 46.7	9.0 to 11.0	Third
36.0 to 39.6	8.1 to 8.9	Borderline
0.00 to 35.7	0.0 to 8.0	Fail

If a student's overall mean falls into one of the borderline ranges defined above, the examining bodies will apply the following rubric for deciding the degree class to be recommended:

- (a) For all students, where a student falls into a borderline then the higher award should be given where either half or more of the credits from Part II are in the higher class or the final year average is in the higher class.
- (b) For all students on integrated masters programmes, where a student falls into a borderline then the higher award should be given where half or more of the credits from Part II are in the higher class.
- (c) Borderline students not meeting either of the criteria described in (a) or (b) above would normally be awarded the lower class of degree unless (d) applies.
- (d) That for all students, borderline or not, Examination Boards should continue to make a special case to the Committee of Senate for any student where the class of degree recommended by the Board deviates from that derived from a strict application of the regulations. Such cases would be based around circumstances pertaining to individual students where these circumstances have not already been taken into account.

Full details of the degree classification regulations are given within the [Manual of Academic Regulations and Procedures](#) (MARP).

Conversion between BSc and Msci

Single majors may change between the three-year BSc and the four-year MSci degree schemes at any time during their second or third year.

In order to continue into the fourth year of the MSci, a Lancaster-based student must meet the criteria for at least a 2.1 BSc degree at the end of year 3; any student, who fails to achieve this will instead be considered for the award of a classified BSc at the end of the third year.

For students on Study Abroad or Placement Year schemes, however, a certain level of performance is required in the second year, measured by the average mark over second-year modules: 14.5 Aggregation Score, achieved at the first sitting. Any Study Abroad student who doesn't achieve that will be transferred to a Lancaster based MSci. Students entering the third year on a Study Abroad MSci scheme are committed to the MSci from then on. Placement Year students who don't achieve 14.5 might be required to transfer to a non-placement year scheme, depending on their potential employer.

Lancaster-based students who withdraw during the fourth year of the MSci, or whose achievement at the end of the year does not qualify them to be awarded an MSci degree, may be awarded a classified BSc degree with Honours, in accordance with the regulations for the corresponding BSc award. The decision on the class of their degree may not be made until the end of the following exam period; however, the student will have access to their university transcript, detailing the marks obtained in the second and third year.

Complaints procedure

The [University Student Complaints Procedure](#) applies to complaints made by current Lancaster University students, or leavers within 3 months of the date of their graduation or withdrawal (the Complaints Coordinator may accept complaints beyond this period if exceptional circumstances apply), in respect of:

- the delivery and/or management of an academic module or programme, or supervised research;
- any services provided by academic, administrative or support services (other than the Students' Union, who operate their own Complaints Procedure)

This procedure does not apply to complaints relating to:

- decisions of Boards of Examiners (these are governed by the Academic Review and Appeal Procedures)

- suspected professional malpractice (if it is established that misconduct of staff or students has occurred that is governed by other disciplinary procedures or external legal systems, then these procedures will be invoked and the complaint will not be dealt with under the student complaints procedure)
- any suspected potential breach of criminal law.

Careers Information

The department's academic employability champions are listed at the start of this handbook and they can provide you with information on ways to develop your employability skills and the types of careers available to you. For more careers information and details of upcoming events, please see the Maths Careers page on Moodle.

Also, the central Careers Service will have department specific sessions in each of your undergraduate years. We strongly advise you to visit Careers regularly so that you can use their expertise to ensure that by the start of your final year you have the necessary work experience, other extra-curricular activities and knowledge of the job market to put together a successful application for your first graduate job. For more information see the [Careers website](#).

Accreditation and membership of professional societies

Graduates with a single-major degree in Mathematics and/or Statistics are recommended to take advantage of membership of one of the following three professional societies.

- [The London Mathematical Society](#) (**LMS**)
- [The Royal Statistical Society](#) (**RSS**)
- [The Institute of Mathematics and its Applications](#) (**IMA**)

Both the RSS and the IMA accredit the following degrees.

- BSc Mathematics*
- BSc Mathematics with Statistics
- BSc Statistics
- MSci Mathematics*
- MSci Mathematics with Statistics
- MSci Statistics
- MSci Mathematics (Study Abroad)*
- MSci Mathematics with Statistics (Study Abroad)
- MSci Statistics (Study Abroad)

* Some conditions apply for the RSS accreditation, see below.

Graduates of the MSci degrees should have taken the MATH492 Statistics Dissertation in order to be accredited, although those who have taken MATH491 might be eligible for GradStat status on an individual basis depending on what other modules have been chosen.

Graduates of the BSc Mathematics, MSci Mathematics and MSci Mathematics with Study Abroad who want their degree to be RSS-accredited should have taken at least four Statistics modules in Years 3-4 (totalling 60 credits).

The Royal Statistical Society will also consider individual applications from graduates of BSc or MSci in Mathematics who would need to produce suitable transcripts to gain accreditation.

Inclusive learning, medical conditions, and disabilities

You are admitted to the University on your academic record. The University welcomes all students and has an array of support services to ensure no student feels disadvantaged. This department follows University Policy and strives to make itself an inclusive department. Some students create an Inclusive Learning and Support Plan (ILSP) with the University's Disability Service, and that is the primary mechanism for communication between the Disability Service and the departments. You can contact the Disabilities Service at any time if you feel you might need advice (for example, you might want to be assessed for dyslexia)

The department of Maths and Stats uses the ILSPs in the following way. At the start of each module, your lecturers and workshop tutors will be provided access to these documents, and they are told that they are expected to comply with the recommendations. Our department has also developed some general guidance for Inclusive Learning that addresses some of the more common items listed in student ILSPs; and all lecturers are expected to follow that guidance at all times. If there are items in your ILSP which are not covered by our Inclusive Learning guidance and require the attention of our lecturer or workshop tutor, then these will be flagged up and emphasized to them by a staff member in our Teaching Office.

If you believe that someone in our department is not fully adhering to one or more items listed in your ILSP, then please contact the Teaching Office at mathsteaching@lancaster.ac.uk and we will do our best to address the issue to your satisfaction. If you would prefer us not to forward your comments about a lecturer or workshop tutor directly to them, then please say so in your message.

If you believe there are items that should be in your ILSP but are not there, then please contact the Disability Office (disability@lancaster.ac.uk). They are able to update their records; they will then pass the updated version to us, which we will immediately act on as appropriate.

Confidentiality: If it is useful for you, do talk in confidence to staff, but please remember that you may not be able to access all the support available to you unless we can inform other staff involved in support arrangements. You may also find it helpful to look at some of the following web pages for local and national background.

[Lancaster Disabilities Service](#) - You can also easily reach the site above via the alphabetical list on the University home page.

[Lancaster Equal Opportunities web pages:](#)

See also: [Equality and Diversity UK](#)

For Year 2 students

The following eight modules are offered in Year 2; each is worth 15 credits.

Weeks 1-10:

- MATH210 Real Analysis
- MATH220 Linear Algebra II
- MATH230 Probability II
- MATH240 Project Skills*

Weeks 11-20

- MATH215 Complex Analysis
- MATH225 Abstract Algebra
- MATH235 Statistics II
- MATH245 Computational Mathematics

*MATH240 also has a group project which runs in Weeks 11-20.

Any single-major degree scheme requires the student to take all eight of these modules. Students enrolled in a combined major scheme would normally take four of the above modules.

See page 42 for more information about the modules required for the various degree schemes.

Short descriptions of modules can be found on page 50. More information about the modules themselves, such as their syllabuses and assessment format can be found online at the [Module Catalogue](#).

One important factor when choosing second-year modules is the effect of the decisions taken on the options available in the third year. As a guide, please see page 50 for the expected list of third-year modules next year with their prerequisites. (However, some further changes may occur.)

For Year 3 students

Any single-major degree scheme requires the student to take eight MATH3xx modules. All Year 3 modules are worth 15 credits. Students enrolled in a combined major scheme would normally take four MATH3xx modules, see page 42 for details.

The provisional timetable for Year 3 modules is a separate document, but should be attached as an appendix.

Some details of these modules are provided after page 50; further details can be found in the [LUSI online Courses Handbook](#).

However, please note that **it is possible that not all of the courses listed below may actually be given**. If you enrol in a module that ends up not being given, then you will be informed by the end of Week 25 of the preceding academic year, and you will be asked to change your registration accordingly.

Please note that changes into or out of a module are only allowed up to and including the Friday of the second week of the module concerned.

Pre-requisites for Third Year options

The pre-requisites for third-year modules can be found on the [LUSI online Courses Handbook](#).

If you are registered for a 4 year MSci programme, please also see the details of the fourth-year modules on page 50 and ensure that your module choices for Year 3 are compatible with the modules you intend to take in year 4.

For the purposes of the regulations,

- MATH313-329 are Mathematics modules;
 - MATH330-345 are Statistics modules;
 - MATH361-362 are neither;
 - All of the above are MATH3xx modules.
- See list of module choices at the end of this booklet.

For Year 4 students

In Year 4 single-major students must take 120 credits, including six 15 credit MATH4xx modules and either a Mathematics or Statistics dissertation, worth 30 credits. See page 42 for specific degree scheme requirements.

The provisional timetable for Year 4 modules is a separate document, but should be attached as an appendix.

Short descriptions of modules can be found on page 48. More information about the modules themselves, such as their syllabuses and assessment format can be found online at the [Module Catalogue](#).

However, please note that **it is possible that not all of the courses listed below or in the provisional timetable may actually be given**. If you enrol in a module that ends up not being given, then you will be informed by the end of Week 25, and you will be asked to change your registration accordingly.

Please note that changes into or out of a module are only allowed up to and including the Friday of the second week of the module concerned.

Module names, prerequisites and exclusions

The pre-requisites for third-year modules can be found on the [LUSI online Courses Handbook](#).

For the purposes of the regulations,

- MATH411-426 are taught MATH4xx Mathematics modules;
 - MATH432-457 are taught MATH4xx Statistics modules;
 - MATH491-492 are neither.
 - All of the above, apart from MATH491-492, are taught MATH4xx modules.
- See list of module choices at the end of this booklet.

Single-major degree schemes

Students may change degree schemes by submitting the appropriate change of scheme form. For example, the BSc Mathematics with Statistics degree scheme is accredited by the RSS, so some students who are currently on the BSc Mathematics degree who are planning on taking 4 or more statistics modules in their third year may wish to switch.

All degree schemes require students to take a total of 120 credits in each year (apart from Placement Year Schemes). All single major degree schemes, including Year Abroad schemes, require students to take all eight 15-credit Year 2 modules: MATH210, MATH215, MATH220, MATH225, MATH230, MATH235, MATH240, MATH245; these are the only MATH2xx modules considered below. In subsequent years there are choices available.

The following are minimum requirements; the vast majority of Year 3 students choose 8 MATH3xx modules instead of just 6. Furthermore, a student may be able to substitute a MATH3xx module for a more advanced taught MATH4xx module, subject to approval by their Director of Studies.

BSc Mathematics

First Year: MATH100, MATH110
Second Year: All eight MATH2xx modules.
Third Year: At least 6 MATH3xx modules

BSc Mathematics with Statistics

First Year: MATH100, MATH110
Second Year: All eight MATH2xx modules.
Third year: At least 6 MATH3xx modules, 4 of which must be statistics modules.

BSc Statistics

First Year: MATH100, MATH110
Second Year: All eight MATH2xx modules
Third Year: At least 6 MATH3xx modules, 4 of which must be statistics modules.

BSc (Placement Year)

For each of the three BSc degrees above, we also offer the option of taking a placement year.

First Year: MATH100, MATH110, FST150

Second Year: All eight MATH2xx modules, FST250

Third Year (Placement Year): FST350a

Fourth Year: FST350b, together with the same requirements for the corresponding Third Year of the non-placement year BSc degree scheme.

MSci Mathematics

First Year: MATH100, MATH110

Second Year: All eight MATH2xx modules.

Third Year: At least 6 MATH3xx modules

Fourth Year: 6 taught MATH4xx modules, and MATH491 or MATH492

MSci Mathematics with Statistics

First Year: MATH100, MATH110

Second Year: All eight MATH2xx modules.

Third year: At least 6 MATH3xx modules, 4 of which must be statistics modules.

Fourth Year: 6 taught MATH4xx modules, 3 of which must be taught MATH4xx

Statistics modules; compulsory 30 credit dissertation module could be either MATH491 or MATH492.

MSci Statistics

First Year: MATH100, MATH110

Second Year: All eight MATH2xx modules.

Third year: At least 6 MATH3xx modules, 4 of which must be statistics modules.

Fourth Year: At least 6 MATH4xx modules, 3 of which must be taught MATH4xx Statistics modules; the dissertation must be MATH492.

MSci (Study Abroad)

The regulations are the same as for the corresponding MSci degree, interpreted appropriately. The requirement "At least 4 MATH3xx Statistics modules" will be taken to mean that at least 50% of the modules taken for assessment while abroad should have a significant statistical component.

Minor modules

In Year 3 of a single-major BSc degree, up to two 15 credit MATH modules may be replaced by minor courses in other subjects in Year 3, but in practice the choice is usually limited by prerequisites; the vast majority of students choose 8 MATH3xx modules. The following are some modules that may be suitable, and have some mathematical content. Note that enrolment is subject to agreement from the administering department.

- MSCI222: Optimisation
- ECON228: Game Theory
- PPR305: Logic and Language

Combined-major degree schemes

Combined major schemes normally require 60 credits per year from each subject. The Mathematics/Statistics component of the various degrees is as follows.

BSc Accounting, Finance and Mathematics

Year 1: ACF100, ECON101, MATH100.

Year 2: MATH220, MATH230, MATH235, MATH245, ACF211, ACF212; one of AC.F213M or AC.F213L; one of AC.F214M or AC.F214L.

Year 3: 60 credits in modules offered by the Department of Accounting and Finance, including ACF301, ACF311, and ACF350. 60 credits in modules offered by the Department of Mathematics and Statistics. MATH330 is mandatory and 30 further credits must be in statistics modules.

Excluded Modules: MATH362, ACF220, ACF222, ACF261, ACF263M, ACF263L, ACF331, ACF332, ACF333, ACF334.

BSc Accounting, Finance and Mathematics (Industry)

Year 1: ACF100, ECON101, MATH100, MNGT150.

Year 2: OWT250a (Social Research Methods 7.5 credits), MATH220, MATH230, MATH235, MATH245, ACF211, ACF212; one of AC.F213M and AC.F213L; one of AC.F214M and AC.F214L.

Year 3: Industrial placement. Dissertation (AC.F340, 22.5 credits)

Year 4: 60 credits from the Department of Accounting and Finance, including ACF301, ACF311, and ACF350. 60 credits from the Department of Mathematics and Statistics, including MATH330 and 30 further credits in statistics modules.

Excluded Modules: MATH362, ACF220, ACF222, ACF261, ACF263M, ACF263L, ACF331, ACF332, ACF333, ACF334.

BSc Computer Science and Mathematics

Year 1: MATH100, MATH110, SCC110, SCC120.

Year 2: MATH220, SCC202, SCC204, SCC210. Three further MATH2xx modules. One further module must be chosen from SCC.201 and SCC.205.

Year 3: Four MATH3xx modules (excluding MATH362). Four of SCC.201, SCC.205, SCC.312, SCC.360, SCC.361 and SCC.363.

Excluded modules: MATH362.

BSc Computer Science and Mathematics (Placement)

Year 1: MATH100, MATH110, SCC110, SCC120.

Year 2: FST/FHM250, MATH220, SCC202, SCC204, SCC210. Three further MATH2xx modules. One further module must be chosen from SCC.201 and SCC.205.

Year 3: Placement and FST350a (10 credits).

Year 4: FST/FHM350b. Four MATH3xx modules (excluding MATH362). Four of SCC.201, SCC.205, SCC.312, SCC.360, SCC.361 and SCC.363.

Excluded modules: MATH362.

MSci Computer Science and Mathematics

Year 1: MATH100, MATH110, SCC110, SCC120

Year 2: MATH220, SCC202, SCC204, SCC210. Three further MATH2xx modules and one further module from SCC.201 and SCC.205. MATH240 must be included if taking MATH49x in year 4.

Year 3: Four MATH3xx modules (excluding MATH362). Four modules from SCC.201, SCC.205, SCC.312, SCC.360, SCC.361, SCC.363

Year 4: One of the following pathways. In all cases, the total number of credits must be 120.

Mathematics pathway:

(prerequisite MATH240 from year 2) One of MATH491, MATH492, or MATH493 (dissertation, 30 credits). Three or four MATH4xx modules and SCC.400 (15 credits each). One or two of SCC.401-3, SCC.411-3 (15 credits each).

Computer Science with Placement pathway:

SCC.421 (dissertation, 30 credits). SCC.419 (placement, 30 credits). Two MATH4xx modules (15 credits each). SCC.400 and one of SCC.401-3 (15 credits each)

Excluded modules: MATH362.

BSc Economics and Mathematics

Year 1: ECON101, ECON105, MATH100.

Year 2: MATH220, MATH230, MATH235, MATH245. Four of ECON207, ECON208, ECON211, ECON212, ECON220, ECON221, ECON222a, ECON222b, ECON223, ECON228, ECON229 and ECON230.

Year 3: MATH330 and three more MATH3xx modules (excluding MATH362) two of which must be in statistics. Four of ECON228, ECON229, ECON230, ECON321-9, ECON33x.

Excluded Modules: ECON103, ECON209, ECON213, ECON224, ECON225, MATH362.

BSc Economics and Mathematics (Industry)

Year 1: ECON101, ECON105, MATH100.

Year 2: MATH220, MATH230, MATH235, MATH245. OWT.250 (Social Research Methods). Four of ECON207, ECON208, ECON211, ECON212, ECON220, ECON221, ECON222A, ECON222B, ECON223, ECON228, ECON229 and ECON230

Year 3: Industrial placement.

Year 4: MATH330 and three more MATH3xx modules (excluding MATH362) two of which must be in statistics. ECON350 (dissertation). Four of ECON228, ECON229, ECON230, ECON320-8.

Excluded Modules: ECON103, ECON209, ECON213, ECON224, ECON225, MATH362.

BSc Financial Mathematics

Year 1: MATH100, MATH110, ACF100, AC.F150.

Year 2: MATH210, MATH230, MATH235, MATH240, AC.F214M, ACF215, ECON224, ECON225.

Year 3: AC.F351b. MATH313, MATH330, MATH331, MATH333

At least two (30 credits) of:

MATH332, MATH334, MATH335, MATH336, MATH345, ACF324, ACF305, ACF321 and up to two modules from:

ACF302, ACF304, ACF322M, ACF323, ACF380

The student should not take more than 120 credits of modules in total.

Excluded modules: MATH362.

BSc Financial Mathematics (Placement Year)

Year 1: MATH100, MATH110, FST150, AC.F100, AC.F150.

Year 2: MATH210, MATH230, MATH235, MATH240, AC.F214M, ACF215, ECON224, ECON225, FST/FHM250.

Year 3: Industrial placement and FST350a (10 credits).

Year 4: FST/FHM350b. MATH313, MATH330, MATH331, MATH333

At least two (30 credits) of:

MATH332, MATH334, MATH335, MATH336, MATH345, ACF324, ACF305, ACF321 and up to two modules from:

ACF302, ACF304, ACF322M, ACF323, ACF380

The student should not take more than 120 credits of modules in total.

Excluded Modules: MATH362.

MSci Financial Mathematics

Year 1: MATH100, MATH110, ACF100, AC.F150.

Year 2: MATH210, MATH230, MATH235, MATH240, AC.F214M, ACF215, ECON224, ECON225.

Year 3: MATH313, MATH330, MATH331, MATH333

At least two (30 credits) of:

MATH332, MATH334, MATH335, MATH336, MATH345, ACF324, ACF305, ACF321 and up to two modules from:

ACF302, ACF304, ACF322M, ACF323, ACF380

The student should not take more than 120 credits of modules in total.

Year 4: The student must take the following core modules:

ACF605, MSC1534, MSC1516 (all 15 credit), MATH491 (30 credit)

Choose at least 2 (30 credits) from:

MATH432 must be taken if MATH332 was not taken in Year 3.

ACF609 must be taken if ACF324 was not taken in Year 3.

MATH445, MATH440, MATH456, MATH457, MATH555

and up to 3 modules (45 credits) from:

ECON412, ECON413, ECON404, MSC1530, MSC1570, MSC1562.

BA French/German/Italian/Spanish Studies and Mathematics

In what follows, LLLL stands for one of FREN, GERM, SPAN

Year 1: MATH100. Either LLLL100 or LLLL101.

Year 2: Four MATH2xx modules. DELC200, LLLL233. Students who took LLLL100 must take LLLL200i and LLLL201i. Students who took LLLL101 must take LLLL200 and LLLL201. One further 15 credit Part II module from the Department of European Languages and Cultures (note that DELC200 does not carry any credit).

Year 3: Year abroad. DELC310 (30 credit).

Year 4: Four MATH3xx modules. LLLL300, LLLL301. 30 credits from Part II modules offered by the Department of European Languages and Cultures.

Excluded Modules: MATH362.

BSc Mathematics, Operational Research, Statistics and Economics (MORSE)

Year 1: MATH100, ECON101, MSC1 101, MSC1 103.

Year 2: MSC1222, MSC1223, MATH 220, MATH230, MATH 235, ECON 207, ECON208. One additional module from any of MSC1, MATH, ECON for which you have the necessary prerequisites (except disallowed combinations).

Year 3: MATH330. Seven further modules. One module must be from ECON, one from MSC1. Three further from any of MSC1, MATH, ECON. Two remaining modules can be chosen freely from across the university.

Excluded Modules: MATH362.

BSc Mathematics, Operational Research, Statistics and Economics (MORSE) (Industry)

Year 1: MATH100, ECON101, MSCI 101, MSCI 103.

Year 2: MSCI222, MSCI223, MATH 220, MATH230, MATH 235, ECON 207, ECON208. One additional module from any of MSCI, MATH, ECON for which you have the necessary prerequisites (except disallowed combinations).

Year 3: Industrial placement.

Year 4: MATH330. Seven further modules. One module must be from ECON, one from MSCI. Three further from any of MSCI, MATH, ECON. Two remaining modules can be chosen freely from across the university.

Excluded Modules: MATH362.

BA Mathematics and Philosophy

Year 1: MATH100, MATH110, PHIL100.

Year 2: MATH210, MATH220, MATH215, MATH225. 60 credits from the Part II modules offered by the Department of Politics, Philosophy and Religion.

Year 3: Four MATH3xx modules. 60 credits from the Part II modules offered by the Department of Politics, Philosophy and Religion. This may include the 30 credit dissertation module PPR.399.

Excluded Modules: MATH362.

BSc Theoretical Physics with Mathematics

Year 1: MATH100, MATH110 (but with PHYS115 instead of MATH115), PHYS100.

Year 2: MATH210, MATH220, MATH215, MATH225, PHYS222, PHYS223, PHYS232, PHYS272.

Year 3: Two MATH3xx modules. PHYS311, PHYS313, PHYS321, PHYS322, PHYS378, PHYS379

Excluded Modules: MATH362

MSci Theoretical Physics with Mathematics

Year 1: MATH100, MATH110 (but with PHYS115 instead of MATH115), PHYS100.

Year 2: MATH210, MATH220, MATH215, MATH225, PHYS222, PHYS223, PHYS232, PHYS272.

Year 3: Two MATH3xx modules. PHYS311, PHYS313, PHYS321, PHYS322, PHYS378, PHYS379.

Year 4: PHYS451, PHYS452. Two modules from MATH4xx, excluding MATH491/2. 30 credits from amongst PHYS48x and PHYS411.

Excluded Modules: MATH362.

Natural Sciences

The Natural Sciences programme offers a flexible degree scheme, which is suited for students who would like to take certain combinations of modules which aren't offered through any other degree scheme. Please contact the Natural Science Coordinator in our department for more information.

Module Descriptions

The full details on assessment proportions and content for all Year 2, 3 and 4 modules can be found online at the [Module Catalogue](#). Some modules listed have a **Project** component to their assessment. These are typically written reports, to be completed by students individually, and are assessed by the lecturer, who will give personalized feedback. Projects are an excellent opportunity to improve a wide range of your skills; the exam component in those modules is weighted less than non-project modules, which may reduce the amount of pressure on students during exam time.

Module Combinations for Condonation Purposes

The available module combinations for the purposes of condonation listed below are applicable to the following programmes of study:

- BSc (Hons) Accounting, Finance and Mathematics
- BSc (Hons) Accounting, Finance and Mathematics (Industry)
- BSc (Hons) Computer Science and Mathematics
- BSc (Hons) Computer Science and Mathematics (Placement Year)
- MSci (Hons) Computer Science and Mathematics
- BSc (Hons) Economics and Mathematics
- BSc (Hons) Financial Mathematics
- BSc (Hons) Financial Mathematics (Industry)
- MSci (Hons) Financial Mathematics
- BA (Hons) French Studies and Mathematics
- BA (Hons) German Studies and Mathematics
- BA (Hons) Italian Studies and Mathematics
- BSc (Hons) Management Mathematics
- BSc (Hons) Management Mathematics (Industry)
- BSc (Hons) Mathematics
- BSc (Hons) Mathematics (Placement Year)
- MSci (Hons) Mathematics
- MSci (Hons) Mathematics (Study Abroad)
- BA (Hons) Mathematics and Philosophy
- BSc (Hons) Mathematics with Statistics
- BSc (Hons) Mathematics with Statistics (Placement Year)
- MSci (Hons) Mathematics with Statistics
- MSci (Hons) Mathematics with Statistics (Study Abroad)
- BSc (Hons) Mathematics, Operational Research, Statistics and Economics (MORSE)
- BSc (Hons) Mathematics, Operational Research, Statistics and Economics (MORSE) (Industry)
- BSc (Hons) Natural Sciences
- BSc (Hons) Natural Sciences (Study Abroad)
- BSc (Hons) Natural Sciences
- BSc (Hons) Natural Sciences (Study Abroad)
- BSc (Hons) Theoretical Physics with Mathematics
- MSci (Hons) Theoretical Physics with Mathematics
- MSci (Hons) Theoretical Physics with Mathematics (Study Abroad)
- BA (Hons) Spanish Studies and Mathematics

Combinable Groups of Second Year Modules for the purpose of condonation

Algebra

MATH220 Linear Algebra II

MATH225 Abstract Algebra

Analysis

MATH210 Real Analysis

MATH215 Complex Analysis

Statistics

MATH230 Probability II

MATH235 Statistics II

Project Skills

MATH240 Project Skills

MATH245 Computational Mathematics

Combinable Groups of Third Year Modules for the purpose of condonation

Algebra and Geometry

MATH321 Groups and Symmetry

MATH322 Commutative Algebra

MATH323 Algebraic Curves

MATH325 Representation Theory of Finite Groups

MATH326 Graph Theory

MATH327 Combinatorics

MATH328 Number Theory

MATH329 Geometry of Curves and Surfaces

Analysis

MATH313 Probability Theory

MATH314 Lebesgue Integration

MATH316 Metric Spaces

MATH317 Hilbert Spaces

MATH318 Differential Equations

MATH319 Linear Systems

Probability

MATH313 Probability Theory

MATH314 Lebesgue Integration

MATH332 Stochastic Processes

MATH345 Financial Mathematics

Statistics

MATH330 Likelihood Inference

MATH331 Bayesian Inference

MATH332 Stochastic Processes

MATH333 Statistical Models

MATH334 Time Series Analysis

MATH335 Medical Statistics

MATH336 Multivariate Statistics in Machine Learning

MATH345 Financial Mathematics

Education
MATH361 Mathematical Education
MATH362 Mathematical Education Placement

Combinable Groups of Fourth Year Modules for the purpose of condonation

Algebra and Geometry

- MATH412 Topology and Fractals
- MATH423 Algebraic Curves
- MATH424 Galois Theory
- MATH425 Representation Theory of Finite Groups
- MATH426 Lie Groups and Lie Algebras

Analysis

- MATH411 Operator Theory
- MATH413 Probability Theory
- MATH414 Lebesgue Integration
- MATH416 Metric Spaces
- MATH417 Hilbert Spaces

Probability

- MATH413 Probability Theory
- MATH414 Lebesgue Integration
- MATH432 Stochastic Processes
- MATH445 Financial Mathematics
- MATH440 Stochastic Calculus for Finance

Statistics

- MATH432 Stochastic Processes
- MATH440 Stochastic Calculus for Finance
- MATH445 Financial Mathematics
- MATH451 Likelihood Inference
- MATH452 Generalised Linear Models
- MATH453 Bayesian Inference
- MATH454 Computationally Intensive Methods
- MATH463 Clinical Trials
- MATH464 Principles of Epidemiology
- CHIC465 Environmental Epidemiology
- MATH466 Longitudinal Data Analysis
- MATH482 Assessing Financial Risk: Extreme Value Theory