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Welcome to the School of Mathematics!

The purpose of this section of the handbook is to collect together useful information about the school and the University for graduate students in mathematics. The handbook contains important practical information with which the School of Mathematics will assume that you are familiar. Although every effort is made to ensure that this information will be accurate, changes do occur over time. Updates will be added to the School of Mathematics website or emailed to your university email address where appropriate.

The following members of the University have particular responsibilities in respect of graduate students and you are encouraged to consult them if you need further information or have any problems you want to discuss at any time during the year.

Key Dates for 2011-12

First Semester: 19 September 2011 – 16 December 2011
First Semester Project Submission Date (where applicable): 17 January 2012
First Semester Examinations: 17 January 2012 – 28 January 2012

Second Semester: 30 January 2012 – 8 June 2012
Easter Break 23 March 2012 - 16 April 2012
Second Semester Project Submission Date (where applicable): 19 May 2012
Semester 2 Examinations: 19 May 2012 – 8 June 2012
MSc Dissertation Submission Date: 7 September 2012

Week 6 of Semester 1 is designated as a reading week. There will be no classes, but you will be expected to work on coursework and prepare for any in-class tests. Some course units, notably those without coursework, will have assigned reading.

Week 12 of Semester 2 is designated as a revision week, when classes are held as normal but will normally be devoted to revision.

In your studies you are expected to refer to text-books and other reference books and read beyond the material which have been explicitly covered in the lectures in order to obtain a deeper appreciation of the subject.
Registration

http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/registration/

Registration can be completed online and will be available from 1st September 2011 until 30th September 2011. You will receive an email from the University containing details of registration. Online registration will now be accessed in a different way to previous years. **The online registration system can be accessed through the Student Portal using your central username and password.**

You can complete registration from any PC with an internet connection and may carry out registration including tuition fee payment online. If you prefer to pay your tuition fees over the telephone, please contact the **Registration Helpline on +44 (0) 161 306 5544.** If you are not able to complete your financial registration online, you will be able do so in the University Precinct Centre from 1st-17th September or in the Whitworth Hall from 18th September. For this you will need to take your log-on details, banking details and payment, a sponsorship letter (if applicable) or financial notice from DIUS (EU students only). Details of the registration process can be found [online](http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/registration/registration-process/) at http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/registration/registration-process/

- **Swipe card**

You will be required to collect your University swipe card (student card) after completing your online registration. International students (i.e., non-EEA passport holders) will need to have their passport and their UK identity card, if it has been issued, available for copying when they attend the Student Services Centre to collect their swipe card. International students who do not have these documents with them will not be issued with a swipe card.

You can find a list of venues issuing student cards [online](http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/registration/registration-process/student-card-collection/)

- **Tuition Fees**

Information regarding tuition fees is available from the Student Services centre, and also online at http://www.campus.manchester.ac.uk/ssc/tuitionfees/

- **Induction week**

Each programme has an induction period at the beginning of the academic year. During this period there is a wide range of activities arranged to help you with the programme, your studies, your life at University, here in Manchester and in the UK.

In the School of Mathematics at the beginning of the academic year, there is an introduction to the School, to university facilities, to staff and your fellow students, and courses on the use of various computer packages, the list of courses relevant for you is in your pack.

In addition to School activities, the University and the Students' Union have a range of introductory events, including the Societies Fair, where you may choose from an enormous list of activities, from Fencing to Mountaineering, from Dance to Films, Chess to Bellringing, from Political and Religious Groups, to Charities and Hobbies.

- **Overseas Students**

Students requiring specialist tutorial assistance and welfare arrangements should contact International Advice Team, Student Services Centre, Burlington Street (275 5000). [http://www.manchester.ac.uk/international/supportservices/advice/](http://www.manchester.ac.uk/international/supportservices/advice/)

For international students, we recommend attendance at the university in-sessional English language support classes. Please see [http://www.langcent.manchester.ac.uk/english/academicsupport/](http://www.langcent.manchester.ac.uk/english/academicsupport/) for further information.

Students from outside the UK may wish to take part in the activities of the International Society, including their Welcome Service. See the website at [http://www.internationalsociety.org.uk](http://www.internationalsociety.org.uk). Other help for overseas students is available from the University's International Advice Team: [http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/immigration/](http://www.studentnet.manchester.ac.uk/crucial-guide/academic-life/immigration/).
Facilities

• Mail and Email

You should collect your mail from room 1.209, 1st Floor, Alan Turing Building. Mail is delivered once a day in the morning, circulars from staff etc. and telephone messages will all be put into the pigeon holes. You are advised to check the pigeon hole corresponding to the first letter of your surname, at least once daily.

In addition you should quickly become familiar with the electronic mail (email) system because all important information is sent in this way, and it will be assumed that you read email sent to your university email address on a regular basis.

You will receive an email from the University IT Services with your University email address and log-in details prior to your registration. In Mathematics you will also have a school UNIX account which you may wish to link to your main university account.

The IT Services Division provides most of the campus IT services for staff and students of the University of Manchester. For information on how to get started, help and support and to download a copy of the 2010-2011 “A Guide to IT Services” booklet please visit their website at: http://www.itservices.manchester.ac.uk/

The School of Mathematics also maintains its own Unix-based network providing access to various specialist mathematical packages. There is an introductory class on this during the first week of Semester 1, and all students are strongly recommended to attend.

Blackboard: We will make extensive use of eLearning environments. We expect that you are, after induction week, able to use them to access course material and communicate with your colleagues.

• Library

• Library sites

The library service is provided through a range of different types of library, as well as over the web. The Main Library (covering nearly all subject areas), The Joule Library (engineering and physical sciences) and The Eddie Davies Library (postgraduate studies in business and management) hold the core working collections. They are supported by a number of smaller, specialised libraries across the campus, most of which duplicate material held in the core libraries.

• John Rylands Library (JRL)

http://www.library.manchester.ac.uk/

The ID card with which you are issued when you register also acts as a library card (swipe card) to gain access to the main university library (JRL). A tour of the JRL and its facilities is usually organised in September and if you are a new student it is important that you attend this.

Books from the main library can be borrowed for 4 weeks. There is also a Short Loan section for the most popular books which can be kept for a limited period. Overdue books incur heavy fines and students may not be awarded a degree, diploma or certificate, unless all books borrowed from the university library have been returned and any fines paid.

• Joule Library

There are five self-service photocopiers and one microfiche/microfilm reader in the Joule Library, located in a room on the Main Level (E Floor). A Technician is on hand during the day if you have any questions about using the copiers.

The Joule Library provides access to 55 networked PCs with CD rewriters and to networked printing facilities.

• School Library

The School maintains a small library in the Brian Hartley Room, 1.211. The School Librarian is Dr. Mike Tso (ext. 63219).
• **Photocopying**

Photocopiers are available in all of the library buildings.

• **Telephone Calls**

Postgraduate student phones in the Alan Turing Building are for internal calls only.

• **Tea and Coffee**

There are vending machines and a snack-bar in the Alan Turing Building on the ground floor. There are tea and coffee facilities on the first floor. Coffee is available in the staff and postgraduate common room on the 1st floor Atrium Bridge from 10.30am.

• **On Completion of Your Programme**

When you leave the School of Mathematics on completion of your programme of study, out of consideration for other students please remove all your property from the building. Any unclaimed property, which is left behind will be assumed to be unneeded and may be disposed of after two weeks. The school has no provision for storage, and your cooperation in maintaining a tidy environment will be much appreciated.
Programme Management

Each programme is run on a day-to-day basis by your Programme Director and Associate Directors. The Postgraduate Committee oversees management of the MSc programmes. Its principal function is to determine and monitor the academic content of the programme, to admit and examine students and to monitor student progress and to decide on policy and planning.

Student involvement in programme management is possible in three ways: through election of representatives to carry your concerns to the SSCC (Staff-Student Consultative Committee) which meets three times a year, typically in October, February and June; via feedback meetings with the Programme Directors, and through Course Evaluation Questionnaires, which are consulted and acted on.

Staff-Student Liaison Committee meetings between the students and the relevant staff take place once per Semester where you may bring forward comments and suggestions, and raise complaints about the programmes.

We encourage you to raise problems immediately as the programme management may not be aware of difficulties. Queries or comments about individual course units should be addressed in the first instance to course unit lecturers.

The Programme Directors operate an open door policy for genuine problems of either an academic or personal nature.

External examiners are appointed to monitor the standards of our teaching and assessment. During the year they review coursework and examination papers and provide critical advice of these which we are obliged to take into account. Following the second semester examinations, they attend the University and scrutinise the written papers and coursework of students, submitting a report to the University on our conduct of the whole student assessment. They also examine the Masters dissertations and moderate marking.

- **Your Programme Director**

The programme director is responsible for the overall running of your programme of studies.

<table>
<thead>
<tr>
<th>Programme</th>
<th>Director/Supervisor</th>
<th>Ext.</th>
<th>Tel.</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical &amp; Applied Fluid Dynamics:</td>
<td>Prof. Jitesh Gajjar</td>
<td>ext. 55895</td>
<td>2.205</td>
<td><a href="mailto:jitesh.gajjar@manchester.ac.uk">jitesh.gajjar@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Mathematical Finance:</td>
<td>Prof Goran Peskir</td>
<td>ext. 63215</td>
<td>2.240</td>
<td><a href="mailto:goran.peskir@manchester.ac.uk">goran.peskir@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Mathematical Logic:</td>
<td>Dr. Marcus Tressl</td>
<td>ext. 63672</td>
<td>2.118</td>
<td><a href="mailto:marcus.tressl@manchester.ac.uk">marcus.tressl@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Mathematics &amp; Computational Science:</td>
<td>Dr. Tony Shardlow</td>
<td>ext. 55821</td>
<td>2.143</td>
<td><a href="mailto:tony.shardlow@manchester.ac.uk">tony.shardlow@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Pure Mathematics:</td>
<td>Dr. Charles Walkden</td>
<td>ext. 55805</td>
<td>2.241</td>
<td><a href="mailto:charles.walkden@manchester.ac.uk">charles.walkden@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Statistics:</td>
<td>Dr. Peter Foster</td>
<td>ext. 55915</td>
<td>2.229</td>
<td><a href="mailto:peter.foster@manchester.ac.uk">peter.foster@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Biostatistics:</td>
<td>Dr. Alex Donev</td>
<td>ext. 63699</td>
<td>1.132</td>
<td><a href="mailto:a.n.donev@manchester.ac.uk">a.n.donev@manchester.ac.uk</a></td>
</tr>
<tr>
<td>Actuarial Science</td>
<td>Dr Kees Van Schaik</td>
<td>ext. 55853</td>
<td>2.142</td>
<td><a href="mailto:kees.vanschaik@manchester.ac.uk">kees.vanschaik@manchester.ac.uk</a></td>
</tr>
</tbody>
</table>

- **Your Personal Tutor**

Your personal tutor is there to take a direct interest in your academic progress and general welfare. Your progress will be followed through informal meetings and records of your marks. Normally your personal tutor is the programme director.

- **Your Lecturers**

Lecturers are responsible for each of the taught course units. They will give lectures, run examples classes, and will be responsible for setting and processing your coursework and examinations.

- **The Supervisor of your dissertation/report**

Your supervisor is responsible for your progress on your dissertation (for M.Sc. students) or report (for Diploma students). Supervisors will be allocated in Semester 2.

- **PG Office**

The Postgraduate Administrator: Anna Bigland (ext. 50176)
The Postgraduate Programmes Administrator: Joanne Pearson (ext. 55802)
Anna and Joanne will be able to offer support and advice on administrative matters relating to your programme. They are located in the Postgraduate Office, behind reception on the ground floor of the Alan Turing Building.
• The Director of Postgraduate Studies in Mathematics:
Prof. Ralph Stöhr (ext. 63647)

• The Head of the School of Mathematics:
Professor Peter Duck (ext. 55831)

• The Associate Dean of Graduate Education in the Faculty of Engineering and Physical Sciences:
TBC

• Vice-President and Dean of the Faculty of Engineering and Physical Sciences:
Professor Colin Bailey (ext. 69111)

Under most normal circumstances the people described in (1)-(5) above should be able to resolve any problems you may have.

A list of staff members in the School of Mathematics, with their room numbers, phone numbers and email addresses is given in Appendix 1.
Student Representation and Feedback

- **Questionnaires**

  The School values feedback from students very highly. Near the end of each semester you will be asked to complete a questionnaire about each course you have taken. You will be asked to evaluate the course content and the standard of teaching. Your feedback will be acted upon. It is important that you complete the questionnaires as they will help the School ensure that the courses are of high quality. You will also receive a questionnaire about the quality of supervision.

- **Committees**

  The main forum in the School is the School Board. It meets five times per year. Postgraduate students have elected representatives on the Board.

  The **Postgraduate Staff-Student Liaison Committee** is a subcommittee of the Board which has postgraduate representative. Further information is available at [https://www.maths.manchester.ac.uk/postgraduate/pgstudies/info/staff-stud-liason.html](https://www.maths.manchester.ac.uk/postgraduate/pgstudies/info/staff-stud-liason.html)

  It deals with matters relating to both taught and research graduate students in the School, rectifying where possible any defects in organisation or other arrangements made for students; identifying problems not immediately soluble and passing these, with recommendations for action to the relevant person or committee. Students can raise problems or grievances and ask advice or liaise with staff.

  The opinion of postgraduate students is sought on other matters of relevance, such as computing facilities and their use.

- **Advice outside the School (in case of problems)**

  In the first instance, you are strongly recommended to take up all academic or personal problems with your Supervisor or Adviser or with your Programme Director for your group or the Director of Postgraduate Studies. You may also seek help outside the school from the following sources:

- **Academic Matters**

  Central Academic Advisory Service offers a confidential service of information and consultation for students who wish to discuss any matters that may be affecting their academic progress (ext. 53033) [http://www.campus.manchester.ac.uk/academicadvisoryservice/](http://www.campus.manchester.ac.uk/academicadvisoryservice/)
Your Programme Of Study

- **Attendance Requirements**

  http://www.campus.manchester.ac.uk/medialibrary/policies/workattendancesstudents.pdf

  All grant-awarding bodies require, for continuation of the grant, that the school confirms periodically that a student's attendance and progress are satisfactory. School also needs to provide a report to UK Border Agency on attendance and progression of students who entered the UK under tier 4 of the points-based system. **We can only do this if your attendance meets the guidelines set out below.**

  In general, you are expected to be in attendance outside normal semester time. The school policy is that M.Sc. students are entitled to about five weeks’ holiday during the year, including public holidays. **You must** agree acceptable times for holidays with your supervisor and Programme Director.

  On taught M.Sc. courses it is expected that all lectures will be attended, although it is realised that there are sometimes unavoidable reasons for absence. **It is your responsibility to make sure that the school is informed immediately in cases of absence (e.g. through illness) and to inform the Postgraduate Office, of any changes in addresses.** All coursework deadlines must be strictly adhered to, except in cases of illness or other reasons agreed with the appropriate member of staff.

  To satisfy the attendance requirements you must attend all specified classes and see your supervisor regularly, although these conditions can be varied by agreement between yourself and your supervisor.

  Failure to meet these requirements could result in an early warning letter and, ultimately, if attendance does not improve, a letter of refusal, banning you from examinations and hence, effectively, from completing the programme.

  Persistent unsatisfactory attendance creates difficulties for all concerned. If this occurs an attempt to resolve the problem will be made in discussions with the Director of Postgraduate Studies and the Programme Director before any formal action will be considered. You are encouraged at all times to make known to your supervisor or the Programme Director any difficulties with the course, or personal problems you may have. Confidentiality will be ensured and you can be sure of a sympathetic response and practical help or advice.

  See also Modes of Study.

- **Course Unit Selection**

  http://www.studentnet.manchester.ac.uk/selfservice/course-unit-selection/

  Course unit selection will be available as a self service facility for students from 19th September. Before registering for courses, you must first check with your Programme Director for approval. The self service course unit selection will close two weeks after the start of teaching for the first semester courses and for full-year courses. It will remain open for second semester courses until the cut-off point two weeks after the start of the second semester.

- **Plagiarism**

  The school and the university take plagiarism very seriously and you must ensure that you understand what plagiarism is and that you understand the penalties involved. The university policy on plagiarism is attached as an appendix.

- **Coursework submission and Penalties**

  Coursework that requires hard-copy submission must be submitted to the reception desk in the Alan Turing building. Submission forms are available and you will be given a receipt by the receptionist.

- **Deadlines for coursework and rules for late submission.**

  The deadline for submission is 4pm on the day the coursework is due.

  Normally each piece of coursework that has not been handed in by the deadline has the mark awarded by 20% per working day and deadline extensions are only given on the basis of mitigating circumstances. In the case of the dissertation normally the student will automatically be given a mark of 0 and the late submission will be treated as a resubmission and capped at 50%.
Notes on Coursework Deadlines for Part-Time Students

In relation to coursework deadlines, if you are a part-time student you can negotiate with the programme director a deadline that is longer than the given date if you know that your work commitments will not allow you to meet the published course deadline. This should be done IN ADVANCE of the deadline.

Grounds for Mitigation

Grounds for mitigation are unforeseeable or unpreventable circumstances that could have a significant adverse effect on the academic performance of a student. Possible mitigating circumstances include:

- significant illness or injury;
- the death or critical illness of a close family member;
- family crises or major financial problems leading to acute stress;
- absence for jury service or maternity, paternity or adoption leave.

Circumstances that will not normally be regarded as grounds for mitigation include:

- holidays and events that were planned or could reasonably have been expected;
- assessments that are scheduled close together;
- misreading the timetable or misunderstanding the requirements for assessments;
- inadequate planning and time management;
- failure, loss or theft of a computer or printer that prevents submission of work on time: students should back up work regularly and not leave completion so late that they cannot find another computer or printer;
- consequences of paid employment;
- exam stress or panic attacks not diagnosed as illness.

For the avoidance of doubt, pregnancy is not an illness but an altered state of normality, so that unless the woman has an illness she decides how near to the birth she will work. Events may arise during pregnancy that may constitute mitigating circumstances, and these need to be judged on an individual basis. Note that U.K. legislation does not allow a woman to work in the first two weeks following the birth.

Absence from the University during the semester for any period of no more than five working days will not normally be regarded as grounds for mitigation unless the absence occurred for good cause within a two-week period immediately preceding a formal university examination or the deadline for submitting a piece of assessed course work or delivering an assessed presentation.

See also Sickness and Absence.

Examinations

First Semester course units are normally examined in January, while Second Semester course units and full-year course units are normally examined in May/June. Full information about the length of each examination paper, the number of questions on each paper and the number of questions you are expected to answer will be given to you by the lecturers in charge of course units. They will also give you examples of typical examination questions. Examination papers from previous years are available via the School’s website:

http://www.maths.manchester.ac.uk/postgraduate/pgstudies/

If you answer more than the number of questions required in the rubric of an examination paper, it is advisable to cross out the questions that you do not want to be marked. Some examiners will mark all the questions you attempt and count the best ones. Others will only mark the number of questions required by the rubric and will ignore later attempts at other questions. The lecturers will tell you in advance which policy they will adopt.

The examination timetables are posted well in advance of the examination periods on the website:
http://www.studentnet.manchester.ac.uk/crucial-guide/academiclife/exams/

You must check the examination timetable in good time. Each student is allocated an individual seat number for each examination and you are required to sit in the seat which has been assigned to you. You can obtain your own individual copy of the timetable from the Student Portal. You can log in to the Student Portal from the website: http://www.manchester.ac.uk/studentnet
The University does not regard failure to read the timetable correctly as an acceptable reason for absence.

- **Re-sitting Examinations**

Should you fail a unit and be granted permission to re-sit by the Examination Board, then the re-sit will normally take place at the next opportunity to sit the examination. This may be in the January or June session of the next academic year, however in some circumstances the examination board, at their discretion, may permit some re-sits over the summer.

- **Re-sitting exams abroad**

Re-sit examinations are held in Manchester. This can mean extra costs for accommodation and travel, and loss of income if students have to curtail vacation employment. Hence international students in particular on occasion ask if they can re-sit examinations abroad. Although such a request appears reasonable, experience shows that arrangements overseas are not sufficiently reliable. Whilst it might be possible to sit the examination in sufficiently secure conditions, problems with invigilation, differences of time zones, safe return of scripts and so on prove very burdensome, and are not sufficiently offset by charging the student a higher fee to cover extra direct costs.

Home students also sometimes ask if they can re-sit examinations away from Manchester, with similar though less severe problems. Hence the University does not normally allow re-sit examinations to be held away from Manchester.
Supervision of Dissertations

- Dissertation Supervisors

Supervisors for students taking a taught M.Sc. or Diploma will normally be allocated during the second semester, taking into account the interests of each individual student. Normally students will start some work on some preliminary reading for their M.Sc. dissertation or Diploma report prior to the Easter break, but the bulk of the work is done in the period following the second semester written examinations.

It is important to structure this time carefully, in particular to allow sufficient time for writing up the dissertation.

- Writing the Dissertation

Formal requirements for the dissertation can be found in the document "Guidance for the Presentation of Taught Masters Dissertations".

Some more general advice is given below:

Background The dissertation should be understandable to other students on the MSc and should assume the reader is familiar with the core courses of the MSc.

Style There is a wide variety of possibilities for the topic and the style will reflect this. Projects of a theoretical nature will tend to be shorter than those with lots of computational experiments. The supervisor will advise on the appropriate style.

Listing of computer code It is recommended that appendices are used to show any significant computer programming that has been undertaken.

Colour The dissertation may include colour figures, where appropriate.

Referencing Full and detailed references should be given.

Further reading The following book is useful guiding to mathematical writing:


Typesetting the Dissertation

A LATEX class muthesis.cls is available for typesetting theses. A skeleton LATEX file that demonstrates how to use this class can be found in /home/support/latex/thesis.tex

- Submission of Dissertations

You should aim to submit your thesis by the end of the registration period for your programme of study, and no later than the final submission deadline. This deadline is currently 4pm on Friday 7th September 2012.

Students are required to submit 2 copies of their soft bound paper thesis to the main Mathematics Reception.

Guidance on presentation of dissertations is available from:

http://www.campus.manchester.ac.uk.medialibrary/researchoffice/graduateeducation/g-pres-diss-pgt.pdf

It is strongly recommended that you use the University’s LaTeX style file muthesis.cls and the template .tex file, thesis.tex available from https://www.maths.manchester.ac.uk/intranet/it-support/useful-files/.

- Resubmission Fees

http://www.campus.manchester.ac.uk.medialibrary/researchoffice/graduateeducation/p-studentresubfees.pdf
Sickness and Absence

When you register you sign to follow University regulations. These require you to attend all classes organised for you. The only reasons for nonattendance are on health or compassionate grounds. If you miss a class you must let the member of staff who is taking the class know why. In the event of injury or illness likely to lead to your absence for any appreciable time, you must let your Programme Director know at the time. Illness must be confirmed by a medical note from your G.P. or other doctor wherever possible. This is particularly important if you have missed an examination or coursework test or coursework deadline as a result of illness. (Please note that some G.P. practices will only provide medical certificates at a charge.) You must always complete a School of Mathematics Special Circumstances Form and submit it to the Postgraduate Office via the Main Reception in the Alan Turing Building. These Special Circumstances Forms are obtainable from the Main Reception in the Alan Turing Building.

For other problems that cause you to miss classes, examinations or coursework, you must also complete a School of Mathematics Special Circumstances Form. Students may be given permission to submit work late if there are special circumstances but this would need to be authorised in due course by the Mitigating Circumstances Panel. You should apply for an extension before the deadline whenever possible. Applications submitted after the deadline must have a good reason for not being submitted before the deadline. Should you be unable to submit coursework by the deadline as a result of illness or any other acceptable cause, you should see the lecturer concerned and your Programme Director. You should also obtain a doctor's note (whenever possible) and complete a School of Mathematics Special Circumstances Form obtainable from the Main Reception in the Alan Turing Building.

• Ill Health

a. It is a requirement of your registration with the University of Manchester that you register with a local general practitioner. A list of GP practices can be obtained from the Student Health Centre, any University hall of residence or a local Pharmacy. According to guidance issued by the General Medical Council it would not be regarded as good practice for a family member to be the registered GP or to offer treatment except in the case of an emergency.

b. You should always consult your GP (or for emergencies the Accident and Emergency Department of a hospital) if your illness is severe, if it persists or if you are in any doubt about your health. You should also consult your GP if illness keeps you absent from the University for more than 7 days including week-ends. If you do consult a GP and they consider that you are not fit for attendance at the University, then you should obtain a note from the doctor to that effect or ask them to complete Part III of the University form ‘Certification of Student Ill Health’ copies of which are available at local GP surgeries. You should hand this certificate to your programme director, tutor or school office as appropriate at the earliest opportunity.

c. If your condition is not sufficiently serious to cause you to seek medical help, then the University will not require you to supply a doctor’s medical certificate unless you are absent from the University due to illness for more than 7 days (in which case see b. above). You must however contact your school as soon as possible and self-certify your illness (that is complete and sign the “Certification of Student Ill Health” form to state that you have been ill) as soon as you are able to attend your school. You should do this if your illness means you are absent from the University for any period up to 7 days (see d.(i)) or if you are able to attend the University but your illness is affecting your studies (see d. ii and iii).

d. The following sub-paragraphs explain what you should do if your illness affects your attendance at compulsory classes or if you consider that your performance in your studies/examinations has been impaired.

   (i). If you are unwell and feel unable to attend the University to take a compulsory class, assessment or examination then you must seek advice by contacting your school immediately, in person, through a friend or family member, by telephone or by email. This is to ensure that you understand the implications of being absent and the consequences for your academic progress, which might be quite serious. You must do this as soon as possible so that all options can be considered and certainly no later than the day of your compulsory class, assessment or examination. If you do not do this then you will normally be considered to have been absent from the class without good reason, or to have taken the assessment or examination in which case you will be given a mark of zero. You must also complete and hand in a “Certification of Student Ill Health” form on your return.

   (ii). You may be unwell but are able to proceed with an assessment or examination and yet you feel that your performance will have been impaired. If you wish this to be taken into account as an extenuating circumstance, you must inform your school about this on the day of the assessment or examination and hand in to your school a completed “Certification of Student Ill Health” form. If you leave this until later it will not normally be possible to take your illness into account when assessing your performance.

   (iii). If, as a consequence of your illness, you wish to seek an extension to a deadline for submitting assessed coursework, you must complete a “Certification of Student Ill Health” form and discuss it with the appropriate person in your school. The application for extension must be made BEFORE the deadline and not retrospectively.
(iv). You may be under occasional and ongoing medical attention which affects your studies. If so, you should obtain a letter from your physician which should be given to your school before the end of the January, May/June or August/September examination period, as appropriate, if you wish your condition to be taken into account as an extenuating circumstance.

Notes:

i. Certification of Student Ill Health forms are available in all schools and halls of residence.

ii. Your school will give you guidance on the effect of any absence from your studies or if you consider your illness has affected your studies. If you have repeated episodes of ill health which is affecting your studies, your school may refer you to the Student Health Centre.

iii. If you are found to have been deceitful or dishonest in completing the Certification of Student Ill Health form you could be liable to disciplinary action under the University's General Regulation XX: Conduct and Discipline of Students.

iv. The use of the “Certification of Student Ill Health” forms by GPs as described above has been agreed by the Manchester Local Medical Committee. A GP may make a charge for completing the form.
Progression and Award of degrees

The normal pass mark for an MSc course is 50% (for PG Certificate and Diploma this is 40%). The ordinances and regulations for the programmes are attached and you should ensure that you read and understand them, particularly the rules for compensation, re-sit and progression.

The MSc programme

The pass mark for the MSc programme is normally 50%. The overall mark in the taught component is calculated as the average of the numerical marks awarded for each course unit weighted by the credits for that unit.

To pass the MSc programme, you must normally:

• achieve an overall mark of 50% or more in the taught component,
• have failed no more than 30 credits and receive a mark of 40% or more in those failed credits,
• achieve a mark of 50% or more in the dissertation component.

You will normally be awarded an MSc with Merit, subject to approval by the Board of Examiners, if you:

• achieve an overall mark of 60% or more in the taught component, with no mark below 50% in any course unit,
• achieve a mark of 60% or more on the dissertation component.

You will normally be awarded an MSc with Distinction, subject to approval by the Board of Examiners, if you:

• achieve an overall mark of 70% or more in the taught component, with no mark below 50% in any course unit,
• achieve a mark of 70% or more on the dissertation component,
• have submitted the dissertation by the end of the period of the programme.

Students who have had to resit any course units will not be eligible for a merit or a distinction.

The Diploma

The pass mark for the Diploma is normally 40%.

To pass the programme, you must normally:

• achieve an overall mark of 40% or more in the taught component,
• have failed no more than 30 credits and have received a mark of 30% or more in those failed credits,
• achieve a mark of 40% or more in the report component.

You will normally be awarded a Diploma with Merit, subject to approval by the Board of Examiners, if you:

• achieve an overall mark of 60% or more in the taught component, with no mark below 50% in any course unit,
• achieve a mark of 60% or more in the report component.

You will normally be awarded a Diploma with Distinction, subject to approval by the Board of examiner, if you:

• achieve an overall mark of 70% or more in the taught component, with no mark below 50% in any course unit,
• achieve a mark of 70% or more in the report component,
• have submitted the report by the end of the period of the programme.

Students who have had to resit any course units will not be eligible for a merit or a distinction.

The Certificate

The pass mark for the certificate is normally 40%.

You will normally be awarded a certificate if you:

• achieve an overall mark of 40% in the taught component,
• have failed no more than 15 credits and have received a mark of 30% or more in those failed credits.
Examiner’s Boards

The Examiners’ Boards have the responsibility to operate the guidelines in a manner which is fair to students, taking into account all known circumstances. Each student is responsible for informing the Boards of any facts that he/she wishes to be considered. These facts may, for example, be concerned with personal difficulties or ill health (whenever possible obtain a medical certificate for ill health). You should always inform your Programme Director. You should also complete a School of Mathematics Special Circumstances Form, obtainable from the Main Reception in the Alan Turing Building.

Remember that if you want the Examiners' Boards to take medical or other special circumstances into account, it is important that you provide independent documentary evidence to support your case, whenever possible.

The deadlines for submitting information about mitigating circumstances to the Examiners’ Boards are:

First Semester Examinations: FRIDAY, 3 FEBRUARY 2012.

Second Semester Examinations: FRIDAY, 8 JUNE 2012.

However, you should submit information about mitigating circumstances as soon as the problem arises, rather than waiting for the deadline. You submit this information by completing a School of Mathematics Special Circumstances Form and submitting it to the Postgraduate Office (Room G.202/G.204, Alan Turing Building), via the Main Reception in the Alan Turing Building, along with supporting independent documentary evidence (such as a letter from your G.P.) whenever possible.

Only new information that has become available subsequent to the meeting of the Examiners’ Board may be used in appeals, other than where exceptional circumstances gave the student good reason to withhold information.

Criteria for assessing students' work

The following criteria will be used in for assessing taught elements, including examination papers and coursework, of the Masters programme.

- **70+** (allows award of distinction). Work of excellent quality showing evidence of independent work, independent reading, originality, high accuracy, critical appraisal, and very good presentation, a wide and thorough understanding of the syllabus, ability to apply the theory and methods learnt to solve unfamiliar problems.

- **60-69** (Good Pass) Work of high quality showing evidence of understanding on a broad range of topics, good accuracy, good structure and presentation with clear aims/objectives and relevant conclusions, a good knowledge of the syllabus, some originality, limited ability to tackle unseen problems.

- **50** (Pass) Work demonstrating a clear ability to acquire and apply knowledge in a coherent, if uncritical fashion. Some understanding and ability to do routine familiar problems, evidence of good understanding of the main ideas in the course units, little originality, reasonable accuracy, good presentational skills with a reasonably clear structure and aims/objectives, attempts to draw conclusions.

- **40-49** (potentially compensatable for Masters) Ability to do routine work, basic understanding of the important course material, no originality limited accuracy, adequate presentational skills, with clear but limited objectives, does not always reach a conclusion.

- **30-39** (Fail). Work shows some understanding of the main elements of the programme material and some knowledge of the relevant literature. Shows a limited level of accuracy with little analysis of data or attempt to discuss its significance.

- **<30** (Fail) Work which does not meet one or more of the pass criteria.

Appeals

Students may appeal against the decision of an Examiners' Board.

Appeals can normally be made on the basis of perceived procedural irregularities. Please note that appeals on the basis of academic judgement are now allowed.
Students are strongly advised to hold informal discussions with the School of Mathematics about their case for appeal, and the appeal procedures, prior to submission of an appeal.

The School allows students to see their marked Mathematics examination scripts. Scripts can only be viewed by appointment and the viewing opportunity will last about 10 minutes. You will receive further information by e-mail before each viewing period.

The School does not re-mark examination scripts. Students can ask the School to check that all parts of their script have been marked, their marks have been added up correctly and their coursework marks have been included correctly. All such requests from students are collated and passed to the Director of Studies, who arranges for the scripts to be checked and the results communicated to the students.

Full information about the formal appeal procedures is given in Regulation XIX (Academic Appeals), which is downloadable from the website: http://www.studentnet.manchester.ac.uk/crucial-guide/academiclife/formal-procedures/academic-appeals/

However, you should note that the purpose of this Regulation is to safeguard the interests of all students. It may be used only when there are adequate grounds for doing so (as specified in the Regulation) and may not be used simply because a student is dissatisfied with the outcome of his or her assessment or other decision concerning their academic position or progress.
Modes of Study

- **Course Units and Credits**

Each course unit (or lecture course) is worth a certain number of credits (usually 15, sometimes 30). To obtain the MSc Degree, students normally need to take course units worth 180 credits in total (120 for the diploma). This includes the dissertation which is worth either 90, 75 or 60 credits depending upon the programme.

Codes for Mathematics course units consist of the letters MATH followed by five digits. With the exception of the dissertation, the first indicates the level of the course unit. In general, a level of 6 corresponds to an MSc unit. The fifth digit denotes the semester in which the course unit is offered: 1 indicates a First Semester course unit, 2 indicates a Second Semester course unit and 0 indicates a full-year course unit.

- **Lectures**

The main method of teaching used by the School of Mathematics is the formal lecture. Lectures usually start on the hour and are of 50 minutes duration. In a lecture, the lecturer presents the subject orally and usually writes notes or gives a power-point presentation or makes use of the overhead projector. You will need to listen, think and take notes.

Your ability to take concise notes is dependent on your ability to listen. Listening needs to be more analytical than is often realised. You need to think at the same time as you listen, so that you develop the ability to recognise what is likely to be important and what is not.

You must make sure that you write down at least everything that the lecturer writes on the board. However, what the lecturer is saying is heard only once; you do not have much time to decide what part of it to write down. A balance must be achieved between taking no notes of the spoken word and trying to make a word-for-word transcript.

When you don't understand the lecturer, don't panic. Keep taking notes and seek help as soon as possible from the lecturer, your tutor or supervisor, and other students. Don't be afraid to ask questions during or at the end of the lecture. Usually other students don't understand either and will admire your courage. Like everybody else, lecturers often make mistakes, so do point these out as soon as you spot them. Remember, too, that you can only master concepts if you keep working at them, by reading textbooks and doing problems. Aim to make a set of neatly set out, coherent notes during the lecture. Some people prefer to make rough notes during the lecture and rewrite them afterwards but very few can keep this up for long.

Moreover, the time after the lecture can be spent more profitably. Notes should be well spaced so that you can read them through and amplify them as a result of further work. You will need to use your notes for revision later in the year, so it is well worth spending a little time after each lecture making sure that your notes are legible and that you can understand them. It is very important that you have a complete set of notes for each course unit.

When reading and amplifying your lecture notes, you should identify the key material (for example, concepts, theorems, applications of theorems, counter examples, techniques), be clear about their role and the way they are used. Look for examples in your notes, textbooks, examples sheets and past examination papers, and add these references to your notes. The syllabus (course unit description) will often clarify the structure of the course unit. If you are having difficulty with the lecture content, do go to see your lecturer. Do this as soon as possible. Otherwise you will fall behind and will have several poorly understood lectures to sort out. It will be easier for your lecturer to help if you can be precise about your difficulty. Take your notes with you and mark the relevant places, with a concise note of your exact difficulty. Sometimes a change of topic in lectures will give you a fresh start, but don't put off sorting out your difficulties.

If you need help from a lecturer (perhaps because you are having difficulty with the lecture content), try to seek help in an examples class, whenever possible. Otherwise, you should speak to the lecturer at the end of a lecture, or contact him or her by e-mail or telephone to arrange a meeting.

If you find that a course unit causes considerable difficulties not only to you but also to many other students, then you should first approach the lecturer concerned (either individually or collectively) and discuss the problem with him/her. If the problem persists then you should approach your Programme Director, who will discuss the problem with the lecturer concerned and other members of staff.

In lectures, students are asked to behave with courtesy and consideration for other students and for the lecturer. Please do not chat to your neighbour during lectures, as this will disturb the concentration of other students and may even distract the lecturer. Students who disrupt lectures persistently will be reported to the Head of School.

Syllabuses (course unit descriptions) for all Mathematics course units may be found at the website:
The syllabus page for each course unit contains a link to the online course material. The nature of the online course material varies from course unit to course unit, but it may include lecture notes, examples sheets and solutions, and past examination papers. Online course material can also be obtained via the Blackboard Learning System. Blackboard is a web-based system that complements and builds upon traditional learning methods used at the University of Manchester. By using the Blackboard system, you can view course materials and learning resources. The software also provides tools for communicating with your lecturer or other students about the course unit, using discussions, chat or e-mail. You can find more information about Blackboard at the website: 
http://www.studentnet.manchester.ac.uk/blackboard/

- **Feedback Tutorials (Examples Classes)**

Each course unit normally has a number of feedback tutorials (or examples classes) associated with it. Feedback tutorials are usually of 50 minutes duration and start on the hour. Lecturers hand out examples sheets to students on a regular basis. In a feedback tutorial, the lecturer goes round the class, helping students individually with any problems they may be having with the questions on the examples sheets or with the lecture material. The lecturer may also work through some of the questions on the blackboard. It is important that you attempt as many questions as possible from the examples sheet before the feedback tutorial. This will enable you to find out what your difficulties are, so that you can make optimum use of the time in the feedback tutorial to ask questions and get help. Discussions with peers will also be helpful in such matters.

Make sure you take all relevant notes, paper and pen to the feedback tutorial. Don't be afraid to ask questions, no matter how trivial they may seem. When model solutions to questions on the examples sheets are provided by the lecturer, do make use of them. Compare your solutions with those given. Sometimes you may learn more from a model solution to a problem for which you have found a correct solution than you will from solutions to problems which have baffled you.

**Students are expected to attend all lectures and feedback tutorials.**

- **Graduate Courses, Seminars**

Graduate students are expected to attend all the seminars of their research groups which take place regularly. It is appreciated that seminars may not appear relevant to one's work, or in many cases they may be hard to follow, but nevertheless seminars provide a useful focus of research activity and give staff/students an opportunity to learn about work being done in other areas. Details of seminars and graduate courses on offer will be circulated separately and are available from the School of Mathematics’ website at http://www.mims.manchester.ac.uk/events/seminars/index.html

- **Coursework**

Some Mathematics course units have a coursework element, which counts towards the assessment of the course unit. Typically, the coursework counts for about 20% of the total marks available for the course unit, but some course units are assessed entirely by coursework while others are assessed entirely by examination. The coursework can take various forms. It can consist of a short test during the Semester, it may take the form of an assessed computer practical or a project or you may be asked to work through a question sheet in your own time and hand in your solutions. Full details will be provided by the lecturers for the course units. Handing in work is most important, whether for assessed or unassessed coursework. It is the only way you will find out whether your ideas are right, whether you have understood the problem correctly and whether your solutions are correct (even if the final answers look right). You should also pay close attention to comments on your work.

When coursework or project work is asked for by a given date, this must be adhered to. For the School of Mathematics, unless there are mitigating circumstances, students will normally lose 20% of the marks awarded to them for the coursework (or project work) for each weekday late that the work was submitted. Thus, work submitted one week late will receive no marks. Students may be given permission to submit work late if there are special circumstances but this would need to be authorised in due course by the Mitigating Circumstances Panel. You should apply for an extension by submitting a School of Mathematics Special Circumstances Form and you should apply before the deadline whenever possible. Applications submitted after the deadline must have a good reason for not being submitted before the deadline. Should you be unable to submit coursework (or project work) as a result of illness or any other acceptable cause, you should see the lecturer or supervisor concerned and your Programme Director. You should also obtain a doctor's note (whenever possible) and complete a School of Mathematics Special Circumstances Form, obtainable from the Main Reception in the Alan Turing Building.
Sometimes the lecturers will ask you to hand in your coursework to the School’s Teaching and Learning Office (Room G.202/G.204, Alan Turing Building) via the Main Reception in the Alan Turing Building. Before handing in your work, you should complete a Coursework Cover Sheet (available from the Main Reception) and attach it to your coursework. You should make sure that all pages of your coursework are fastened together securely with a staple. You will be given a receipt which you should keep safely, in case you are asked to produce it later.

If you miss a coursework test, then you must obtain a doctor's note (whenever possible) and complete a School of Mathematics Special Circumstances Form, obtainable from the Main Reception in the Alan Turing Building. Your case will then be considered by the appropriate Mitigating Circumstances Panel, which will decide what action to take (if any).

• **Private Study**

As a rough guide you should be spending approximately twice the number of instruction hours in private study, mainly working through the examples sheets and reading your lecture notes and the recommended text books. You may study for several hours at a time, or make use of short periods of time. It is easy to fritter away twenty-minute or half-hour periods but over a week they can amount to several hours lost, so try not to waste those valuable twenty-minute periods. The odd hours between lectures and feedback tutorials are particularly valuable, as resources (such as members of staff, the library and other students) are available for consultation.

• **Revision Techniques**

Your study plan for the year should include time for revising for the formal examinations, which are held at the end of each Semester. Revision is not a substitute for steady, hard work while course units are in progress. The revision period before examinations is a time for refamiliarising yourself with ideas which may have been crowded out by more recent work, rather than trying to understand new work. The best way to memorise mathematics is by familiarity through regular use. Some formulae, however, will be hard to remember and these you should be able to derive where necessary from more basic principles. Learn the basic steps in proofs, rather than try to commit the entire proof to memory.

You should allow yourself plenty of time to read through all your lecture notes and look back through (and, where necessary, complete) the examples sheets. Mathematics is best revised (as well as learned) by doing it. Try to answer questions from past examination papers.

Practise doing examination questions under self-imposed examination conditions without the aid of your notes. Difficulties which you encounter when trying to do problems and examination questions will force you back to your lecture notes and textbooks for information on the topic you are revising. Make a list of the points you do not understand and the problems you cannot do and arrange to see the appropriate lecturer to go through your difficulties.

Try to avoid working all through the night before an examination, because you might then tire in the examination room. You are likely to do better in the examination if you are feeling wide awake. During your revision, remember to have some variety in your studies.

Intersperse reading your lecture notes with working through problems from examples sheets and questions from past examination papers. Do not forget to make time for some relaxation during the revision period.

• **Examination Technique**

It is very important that you organise well the time you spend in the examination room. Before you start writing, you should read the instructions at the start of the paper and then read the whole paper carefully, before deciding which questions you are going to answer first. Try to answer the questions posed and avoid including in your answers things that are not relevant to the question that has been set. Attempt to answer the exact number of questions requested. It is usually easier to get the first 40% of the marks on any question rather than the last 20%. If you are short of time and have not attempted the number of questions specified in the rubric, it is better to spend the remaining time starting to answer another question rather than attempting to make a good answer better.

If you get stuck on a question, don't panic. You may find that you can't do one part of a question but, by assuming the result, you can continue with the rest. You may be able to complete the missing part later. If you are completely stuck, move on to the next question you intend to do. You can always go back later if you have time to spare or a fresh idea occurs to you. Sometimes, when you are working on one question, ideas will occur to you for solving another. Jot them down immediately for future reference so that you do not forget them.
2011-12 School of Mathematics Postgraduate Taught Programmes Handbook

You should aim to allow yourself time to read through your answers before the end of the examination. Never leave early. You may see something that you missed first time, or get a useful new idea. On the other hand, if you are running out of time on your last question but know how you would have continued; give a brief description of your intended method.

[Much of the material is taken from the booklet ‘Study Skills for Mathematics’ edited by Pam Bishop and Laurence Nicholas and published by Sheffield Hallam University Press.]
Complaints

The University of Manchester recognises that students may have legitimate reasons for complaining about their course, the facilities or services provided, or other students or staff. It is hoped that most complaints can be resolved by a student taking up the matter directly with the staff concerned, or with the Head of School. However, it is recognised that this is not always possible and the University’s Student Complaint Procedure is designed to provide students with a fair procedure for resolving complaints that cannot be dealt with by informal means. Further information about the formal complaints procedure is given in Regulation XVIII, which is downloadable from the website:
http://www.studentnet.manchester.ac.uk/crucial-guide/academicleife/formal-procedures/complaints/

Regulation XVIII ‘Student Complaints Procedure’ can be downloaded from:
http://documents.manchester.ac.uk/display.aspx?DocID=1893

- Accommodation Problems

You should consult the Accommodation Office, First Floor, University Place, Oxford Road, ext. 52888, http://www.accommodation.manchester.ac.uk/, with any enquiries relating to your student accommodation.

- Grants and Awards Problems

You should consult Postgraduate Office with any queries relating to payment of either tuition fees or maintenance

- Equal Opportunities, Sexual Harassment

Students having problems in these areas should contact the Student Support and Services, John Owens Building (ext. 52071; http://www.campus.manchester.ac.uk/studentsupportandservices/)
MSc Actuarial Science

New for entry in 2011, the MSc in Actuarial Science will provide a strong grounding in the mathematics of actuarial science and will address both the current and future needs of the industry. Accredited by the Institute and Faculty of Actuaries, the course will offer exemptions to the following Professions Core Technical exams: CT4, CT6 and CT8 and will be suited to those with a good first degree in mathematics or a degree with substantial mathematical content.

The programme combines elements from Mathematical Finance, Statistics and more specialised actuarial topics such as mortality models, risk theory and the use of Bayesian statistics to name a few in order to provide a student with a working knowledge of all the main mathematical techniques and concepts present in modern actuarial practice.

Above and beyond that the program offers an intensive and rigorous education in the probabilistic concepts that are at the core of the topics studied, thus providing a successful student with the mathematical skills and tools necessary to be ready for future developments in the actuarial field as well as to be eligible for a broader range of employment sectors, including for example financial and risk management.

- Structure of the Programme

Students chose 120cr of courses across 2 semesters (Full Time) or across 4 semesters (Part Time) from the following lists:

You must select the following courses:

Mandatory:

Semester 1
- MATH67001 Martingales with Applications to Finance (15cr)
- MATH68011 Linear Models and Non-Parametric Regression (15cr)
- MATH69511 Actuarial Models (15cr)
- MATH69531 General Insurance (15cr)

Exam Dates: 16th - 27th January 2012

Semester 2
- MATH68032 Time Series (15cr)
- MATH68052 Generalized Linear Models and Survival Analysis (15cr)
- MATH69102 Stochastic Modelling in Finance (15cr)
- MATH69542 Risk Theory (15cr)

Exam Dates: 17th May - 6th June 2012

You must also be registered for your dissertation:
- MATH 69500 MSc Dissertation (60cr) due 7th September 2012

and you must undertake the compulsory Heath and Safety course via Blackboard. MATHS0000

You will have a total of 180cr for the MSc. Should you wish to audit extra courses, then please speak to your Programme Director.
MSc in Biostatistics

- **Aims of the programme**

Statistical methods make an invaluable contribution to developments in almost all of the basic bio-medical sciences, including biochemistry, biophysics, physiology, pharmacology, genetics, imaging, and informatics. They also make a major contribution to behavioural and social sciences relevant to health research (psychology, sociology and economics). Their reach extends from the optimal design of laboratory experiments to the evaluation of public health interventions to prevent ill-health; from the discovery, development and evaluation of new drugs and other more complex treatments to studies of the causes of disease, the evaluation of biomarkers to aid diagnosis (classification of disease), prognosis (prediction of disease outcome) and the evaluation of mechanisms of treatment action (treatment-effect mediation).

Biostatistics is essentially a set of principles and methods for the design and analysis of research studies so that they are capable of answering the questions posed and of separating true effects from bias. It allows pattern and meaning to be extracted from often complex data sets, while at the same time allowing for the role of chance variation. The increase in computing power in the latter part of the 20th century has allowed a huge rise in the complexity and range of methods, making this an exciting and challenging area of work for those with the right skills.

In the UK, there is a serious shortage of statisticians trained to Master’s level, which is the entry level to a broad range of employment sectors including the pharmaceutical industry, medical research and health services. The aim of this Master’s course is to equip students with the required knowledge to follow careers in these areas.

The course is run jointly by statisticians in the School of Mathematics and in the School of Community Based Medicine at the University of Manchester, who have extensive experience of applied research in the bio-medical and health sciences. Therefore, the course provides unique opportunities for the students to gain knowledge and experience from a wide range of experts in both theoretical and applied biostatistics.

The Advisory Board of the course are senior scientists working in the Pharmaceutical Industry (Pfizer, GSK and AstraZeneca), in research universities and the UK National Health Service (NHS), hence ensuring that the course stays in tune with the challenges that today’s biostatisticians face in their careers.

- **Structure of the Programme**

The full-time course consists of course work and a dissertation over a period of one year (three semesters). The course work consists of eight units, four in each of semesters one and two. Unit 8 will consist of a number of smaller modules from which students must choose four according to their special interests. Part–time MSc students complete the course over 2 years with each unit examined at the end of the semester in which it is taken and the M.Sc dissertation prepared in the last 14 weeks of the second year.

The course will give students knowledge and understanding of modern statistical methods. They will learn about their application in all areas of biological, behavioural and social sciences aimed at understanding and improving human health. The course will equip students with good knowledge of at least one commonly used statistical software packages (eg R, Stata). Opportunities are given to develop presentation and consultancy skills which are much valued by employers, as is evidence that students has undertaken their own piece of applied research.

Students chose 120cr of courses across 2 semesters from the following:

You must select the following courses:

**Mandatory:**

Semester 1
- MATH68071 Introduction to Clinical Trials
- MATH68201 Introduction to Biostatistics
- MATH68341 Linear and Generalised Linear Models
- MATH 64801 Epidemiology and Survival Analysis

Exam Dates: 16th - 27th January 2012

Semester 2
- MATH 64902 Advanced Topics in Biostatistics
- MATH68082 Design with Advanced Topics
- MATH68122 Computationally Intensive Statistics
- MATH68132 Longitudinal Data Analysis

Exam Dates: 17th May - 6th June 2012
It may be possible to substitute a project for one or more of the above units, please see your programme director for further information.

You must also be registered for your dissertation:
MATH68160 MSc Dissertation (60cr) due 7th September 2012

and you must undertake the compulsory Heath and Safety course via Blackboard. MATHS0000

You will have a total of 180cr for the MSc. Should you wish to audit extra courses, then please speak to your Programme Director.
MSc and Diploma in Mathematical Logic and the Theory of Computation

• Aims of the Programmes

The one year taught M.Sc. programme and 9 month Diploma programme are given by the School of Mathematics in collaboration with the School of Computer Science and the Linguistics Group of the School of Languages, Linguistics and Cultures. The aim of the Programmes is to give students a rigorous grounding in some of the main areas of modern mathematical logic, with a particular emphasis on more recent developments which are of potential interest in information technology. The principal difference between the MSc and the Diploma programmes is that the MSc programme includes a substantial dissertation component which would provide a valuable training for anyone intending to pursue a research career.

• Structure of the Programmes

The M.Sc. programme comprises a total of 180 credits which is split between 90 credits of taught units and 90 credits allocated to a dissertation.

The Diploma programme comprises a total of 120 credits with the same structure as the M.Sc. programme except that in place of the dissertation the student completes a less substantial report worth 30 credits.

Students chose 90cr of courses across 2 semesters from the following lists:

You must select at least 45cr from the following courses:

Semester 1
MATH63001 Predicate Logic (15cr)
MATH63011 Computation and Complexity (15cr)
MATH63021 Set Theory (15cr)
MATH63171 Mathematics and Computation (15cr)

Exam Dates: 16th - 27th January 2012

Semester 2
MATH63032 Non-Standard Logics (15cr)
MATH63042 Gödel’s Incompleteness Theorems (15cr)
MATH63052 Model Theory (15cr)

Exam Dates: 17th May - 6th June 2012

You may select the rest of your modules from the following list. You may only chose 15cr from the starred units:

Semester 1
COMP61011 Machine Learning and Data Mining (15cr)
COMP61111 Logical Reasoning and Applications (15cr)
COMP60721 Data Engineering (15cr)
LELA70041 Introduction to Grammatical Theory* (15cr)

Exam Dates: 16th - 27th January 2012

Semester 2
COMP61132 Modal Logic and Description Logics (15cr)
LELA70032 Advanced Semantics* (15cr)

Exam Dates: 17th May - 6th June 2012

In addition units from the MSc in Pure Mathematics and MSc Statistics may be chosen in consolation with your programme director

You must also be registered for your dissertation/diploma project:

MATH63140: MSc Dissertation (90cr) due 7th September 2012 OR
MATH 63160 PG Diploma Project due 17th May 2012
and you must undertake the compulsory Heath and Safety course via Blackboard.  MATHS0000

You will have a total of 180cr for the MSc or 120cr for the PG Diploma. Should you wish to audit extra courses, then please speak to your Programme Director.

Students are also normally expected to attend logic seminars and short skills modules in Unix, Latex and/or other software packages.

Each of the Computer Science (COMP) units above is run over a very short time period. Typically they involve preliminary reading followed by an intensive course run over one week. Clearly this will produce clashes with other modules, which should be considered and discussed with the Programme Director by students who wish to take any of these units.

Information on the COMP courses may be found at the website  
http://www.cs.manchester.ac.uk/postgraduate/taught/programmes/fulllist/

Information on Linguistics courses may be found at the website  
http://www.llc.manchester.ac.uk/

Prerequisites which may be required for COMP or LELA modules should be discussed with the lecturer concerned or with the relevant school contact listed on page A5.

For syllabi of Group A modules, see below, or on the website  
http://www.maths.manchester.ac.uk/postgraduate/pgstudies/programmes.html#Mathematical_Logic

- **Students with No Previous Background in Logic**

  The core of modern mathematical logic is predicate logic. This subject is treated in MATH63001, and the more elementary propositional logic will be covered rather briskly in the first two weeks. Students with no previous experience of logic are strongly advised to read a suitable introductory treatment of propositional logic in conjunction with MATH63001. Such a treatment can be found for example in the books of Enderton and Hamilton noted in the MATH63001 syllabus.

- **Dissertations**

  You should discuss your choice of dissertation topic with the programme director by the end of the second semester lectures at the latest. You will normally start serious work on your dissertation immediately after your second semester examinations, although you may have done some preliminary reading before that.

  Normally an M.Sc. student’s dissertation will be supervised by one of the above but in some cases the supervisor may be another appropriate member of staff of the mathematics or computer science schools or the linguistics group. The choice of supervisor will be made in consultation with the student in semester 2, when the interests of the student become apparent.
MSc Mathematical Finance

- Aims of the programme

The programme’s primary aim is to provide students with a knowledge and understanding of the main theoretical and applied concepts in the mathematics underlying modern finance theory. The focus of the programme is on mathematical theory and modelling, drawing from the disciplines of probability theory, scientific computing and partial differential equations to model relations between asset prices and interest rates, and to develop models for pricing, risk management and financial product development.

A further programme aim is to develop students’ power of inquiry, critical analysis and logical thinking and to apply theoretical knowledge to current issues of policy and practice. These skills will be essential in carrying out a piece of original empirical research. This research constitutes the final dissertation stage of the Masters programme. To this end, the programme offers high quality teaching informed by theoretical and empirical research and is taught by research-active staff.

Finally, the programme aims to provide a thorough training in financial mathematics to prepare students for careers in areas such as financial engineering, risk and investment management and derivative pricing. It also aims to provide many of the tools required to undertake high quality research in academic and financial institutions [MSc only]. The programme meets the requirements of the national qualifications framework for a level M (Masters) degree.

- Intended Learning Outcomes of the programme

Upon completion of the programme, students passing at the MSc level of achievement should be able to demonstrate:

i. Have advanced knowledge and systematic understanding of the main theoretical and applied concepts in mathematical finance including: hedging strategies; binomial model; risk-neutral valuation; diffusion-type models for stock prices; Black-Scholes equation, stochastic volatility models.

ii. Have a comprehensive knowledge and understanding of derivatives and financial engineering.

iii. Have a critical understanding of stochastic calculus and be able to apply stochastic processes in discrete and continuous financial models.

iv. Be able to draw from the disciplines of probability theory, scientific computing and partial differential equations to derive relations between fundamental variables such as asset pricing, market movements and interest rates, which can be used to develop models for pricing, monitoring, risk management and product development.

v. Knowledge and expertise in the development of a research enquiry and to select the tools necessary for executing the research; the skills to pursue independent learning, to analyse and interpret quantitative and qualitative data and to present results in a form that is appropriate.

vi. A critical awareness of research issues, methodologies and methods in mathematical finance, combined with a knowledge of corresponding skills in planning and managing a research project equipping students to carry out a piece of research.

- Structure of the Programme

Students take 120cr of courses across 2 semesters

Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH67001</td>
<td>Martingales with Applications to Finance</td>
<td>15cr</td>
</tr>
<tr>
<td>MATH67101</td>
<td>Stochastic Calculus</td>
<td>15cr</td>
</tr>
<tr>
<td>BMAN70141</td>
<td>Derivative Securities</td>
<td>15cr</td>
</tr>
<tr>
<td>BMAN70381</td>
<td>Foundations of Finance Theory</td>
<td>15cr</td>
</tr>
</tbody>
</table>

Exam Dates: 16th - 27th January 2012

Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH60082</td>
<td>Computational Finance</td>
<td>15cr</td>
</tr>
<tr>
<td>MATH67112</td>
<td>Brownian Motion</td>
<td>15cr</td>
</tr>
</tbody>
</table>
MATH69102  Stochastic Modelling in Finance (15cr)
BMAN71122  Financial Econometrics (15cr)

Exam Dates: 17th May - 6th June 2012

You must also be registered for your dissertation:
MATH 62733  MSc Dissertation (60cr) due 7th September 2012

and you must undertake the compulsory Health and Safety course via Blackboard. MATHS0000

You will have a total of 180cr for the MSc. Should you wish to audit extra courses, then please speak to your Programme Director.

It is required that all coursework must be attempted and deadlines adhered to. Late submission of coursework will normally not be accepted. Students are expected to spend additional private study time on each course unit preparing for the various types of classes and to consult further sources of information reading beyond the material which have been explicitly covered in the lectures. This is essential for reviewing, understanding, consolidating and obtaining a deeper appreciation of the course material. Furthermore, all M.Sc. students are encouraged to attend the key skills courses organised by the Graduate Development Scheme of the Faculty of Engineering and Physical Sciences. Further details are available on http://www.graduateeducation.eps.manchester.ac.uk/graddev/taught/
MSc Mathematical and Computational Science

• Rationale

Nowadays research progress in science and engineering is acknowledged to depend on the three inter-related aspects of theory, experiment, and simulation. Whilst the first two aspects tend to be more discipline-specific, progress in the third aspect (simulation) requires a cross-disciplinary approach. Expertise from the applied sciences, engineering, mathematics, and computer science must be brought together to make leading-edge progress. With the improvement in computational power, scientists and engineers are taking on ever more difficult mathematical models, incorporating uncertainty and multiple physical models, and demanding higher resolution in their simulations. To satisfy these demands, researchers need a strong background in mathematics and computer science. Mathematics provides insight into models and rigorous justification for computations and computer science provides the framework for high-performance computation and visualisation.

The MSc programme in Mathematics and Computational Science is being run by the School of Mathematics. The School of Mathematics has a long tradition in computation with a strong Numerical Analysis group (led by Professors N. J. Higham FRS and D. J. Silvester), and a strong presence in the related areas of dynamical systems and computational fluid dynamics. In particular, the Numerical Analysis group have been running an MSc for over 40 years and has been successful in creating mathematically and computationally literate graduates.

• Aims and Objectives of the Programme

1. Teach general principles of numerical computation to students who have a strong academic track record in a mathematically-based science or engineering discipline.

2. Provide sufficient breadth and depth of experience in numerical computation that students will have significantly advanced their career prospects within the academic _eld (especially continuing with Ph.D. studies) and in specialised sectors of industry and commerce.

3. Equip students with sufficient knowledge of numerical computation and application areas that they will be able to apply their knowledge to at least one application area, through the development of appropriate numerical software.

4. Provide an opportunity to engage in a research project in computational applied mathematics or computational science.

• Structure

Students chose 90cr of courses across 2 semesters from the following:

You must select the following courses:

Mandatory:

Semester 1
MATH 66101 Numerical Linear Algebra (15cr)
MATH65051 Bifurcations & Singularities (15cr)
MATH69111 Scientific Computing (15cr)
MATH66041 Essential PDEs (15cr)

Exam Dates: 16th - 27th January 2012

Semester 2
MATH66132 Numerical Optimization (15cr)
Plus one other level 6 mathematics module (15cr)

Exam Dates: 17th May - 6th June 2012

Please see your programme director for further course unit information.

You must also be registered for your dissertation:
MATH68160 MSc Dissertation (90cr) due 7th September 2012
and you must undertake the compulsory Health and Safety course via Blackboard. MATHS0000

You will have a total of 180cr for the MSc. Should you wish to audit extra courses, then please speak to your Programme Director.

- **Dissertation**

The second part of the MSc is the dissertation and every student must write a dissertation under the supervision of an advisor by the end of the academic year. A list of dissertation topics is made available after the January examinations and it is the student's responsibility to contact potential advisors and ask one to be their supervisor.

It is important for every student to find a project and supervisor early in Semester Two. Students can contact the Programme Directors about this process. Dissertations topics will be available from staff members within the Schools of Mathematics. Some topics may be suggested by supervisors in other schools in the Faculty of Engineering and Physical Sciences or by industrial contacts; in these cases a co-supervisor in mathematics or computer science will be assigned. A project with an industrial contact may involve spending time on-site with the industrial partner. The list of projects offered varies from year to year.

At the end of Semester Two, all students are required to provide an interim report and attend an oral on their progress. The oral is attended by at least two members of staff. Following the oral, students will receive feedback on their progress from their dissertation supervisor. The interim report and oral are not formally examined and serve to give students an objective view on their studies towards an MSc dissertation.

- **Teaching and Learning**

The teaching methods employed in the programme are small group lecturing, examples classes, supervised laboratory exercises, and written projects and a written dissertation. Examples classes are classes in which the students work through problem sheets with a member of staff in attendance and able to offer help and advice; these are used for the more mathematically oriented modules. Laboratory classes are supervised classes in a computer laboratory, in which students work on computer-based exercises.

Students are expected to spend additional private study time on each course unit, which is essential for reviewing and understanding course material, consulting further sources of information, and preparing for the various types of class. Lecturers will include staff at the university, visiting academics, and also guest lecturers from industry who will impart knowledge of real-life applications and industrial numerical software needs.

**NAG Prize** Each year NAG award a prize of 750 pounds to the student performing best in the three core modules on the January examinations. The award of the prize is decided at the Semester One examiners' meeting.

- **Seminars**

The Schools of Mathematics and Computer Science encourage all postgraduate students to attend a selection of seminars, which enables them to hear leading researchers speaking about work in applied mathematics and computer science in general.

Students should keep a records of the seminars they have attended, with the title, name of speaker, and their comments/notes. This enables students to build a record of which areas of current research they find the most interesting, which will help with the selection of a dissertation topic.
MSc in Pure Mathematics

• Aims of the Programme

The programme aims to: provide you with training in a wide range of modern developments in pure mathematics; encourage a sophisticated, rigorous and critical approach to mathematics; and to prepare you to follow a career as a professional mathematician in industry and/or research.

• Structure of the Programme

Full-time students

During the first two semesters, you will undertake the taught element of the programme. This comprises of a number of taught course units and project work. Each taught course unit, including the project, is worth 15 credits (except for the double project, which is worth 30 credits). You are free to choose which courses you do, subject to the following:

• You must take 90 credits of taught course units (for the MSc and Diploma programmes) and 60 credits (for the Certificate).
• MSc and Diploma students must write a project in either the first or second semester. If you decide to write the project in the first semester, then you may (subject to approval by the project supervisor and the course director) extend it to a double project in the second semester.

It is recommended that (for MSc and Diploma students) you take 45 credits in each semester. You will have the opportunity to discuss which courses you will take when you meet your personal tutor at the beginning of each semester.

You will make the final decision as to which courses you will take for credit at exam registration.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List A</strong></td>
<td><strong>List B</strong></td>
</tr>
<tr>
<td>MATH61011 Fourier Analysis &amp; Lebesgue Integration</td>
<td>MATH61002 Linear Analysis</td>
</tr>
<tr>
<td>MATH62001 Group Theory</td>
<td>MATH61022 Analytic Number Theory</td>
</tr>
<tr>
<td>MATH62051 Hyperbolic Geometry</td>
<td>MATH61062 Differentiable Manifolds</td>
</tr>
<tr>
<td>MATH65051 Singularities &amp; Bifurcation</td>
<td>MATH61072 Algebraic Topology</td>
</tr>
<tr>
<td>MATH62041 Non-Commutative Algebra</td>
<td>MATH61112 Ergodic Theory</td>
</tr>
<tr>
<td></td>
<td>MATH62112 Lie Algebras</td>
</tr>
<tr>
<td></td>
<td>MATH62122 Galois Theory</td>
</tr>
<tr>
<td>Project, or Double Project</td>
<td>Project, or Double Project</td>
</tr>
</tbody>
</table>

| **List C** |
| MATH63001 Predicate Logic | MATH63032 Non-Standard Logics |
| MATH63011 Computation and Complexity | MATH63052 Model Theory |
| MATH63021 Set Theory | MATH63042 Gödel’s Theorems |

After completing the taught component of the programme, you will commence work on your dissertation (for MSc students, worth 90 credits) or report (for Diploma students, worth 30 credits). More details about dissertations and reports are given below.

Part-time students

Similar arrangements hold if you are a part-time student. The part-time programme lasts 2 years. You will be expected to study 90 credits of taught material (including a compulsory project) during the 4 semesters, subject to the same restrictions as for full-time students listed above. You will also be expected to write a 90-credit dissertation (for MSc students) or a 30-credit report (for Diploma students).

The exact arrangements will vary for each part-time student, depending on which course units you want to take and any of your other commitments. You will have spoken with the programme director either before commencing the course or during the induction week to decide on which course units you will study and when. For example, you may wish to take two course units in the first two semesters.
semesters, write your project over the summer of your first year, take another course unit in semester 3, and finally write the dissertation during semester 4 and over the summer of the second year.

- **Taught course units**

Most course units are based around a number of fifty minute lectures, supported by examples classes and, possibly, by additional support classes.

Course units in List A are normally based on 24 lectures (with two given each week), a weekly examples class, and extra reading material for independent study and to be discussed during extra support classes.

Course units in List B are normally based on either 24, 30, or 36 lectures, together with either a weekly or fortnightly examples class.

Course units in List C are courses from the MSc in Mathematical Logic & the Theory of Computation. If you wish to take one of these courses you should contact the lecturer directly to ensure that you meet the prerequisites for that course. You should also be aware that the second semester examinations for these courses take place at Easter, and not during the May examination period.

Attendance at all lectures and support classes is expected. It is rarely possible in mathematics to understand everything that is presented in a lecture at the time, but students should aim to make a thorough record of each lecture as a basis for further study, while at the same time aiming to obtain an overview of the lecture. Some lecturers may give out printed notes which can then be annotated during the lecture. This material is also normally available on the School website.

- **The Project**

You are required to write a project during the taught component of the programme, written under the guidance of your project supervisor. A single project is worth 15 credits. If you write the project during the first semester then, if you and your project supervisor feel that it is going well and you wish to take the subject further, you may extend the project into a 30-credit project, to be written over the two semesters.

Assessment is based primarily on the written project, but a short oral exam will also take place.

More details about the project, such as advice on selecting a topic, the amount of work required, and the method of assessment are given below. You can also find some informal advice at [http://www.maths.manchester.ac.uk/postgraduate/pgstudies/docs/pure_msc_essay_diss_guidance.pdf](http://www.maths.manchester.ac.uk/postgraduate/pgstudies/docs/pure_msc_essay_diss_guidance.pdf).

- **Dissertations and Reports**

For MSc students the dissertation involves you working closely with a member of staff, normally on a topic of current research interest, and then writing and submitting a dissertation. The dissertation may be expository or may contain original research. Normally, you will write your dissertation on a topic related to your project (in which case your project supervisor will normally become your dissertation supervisor), but it is possible to write your dissertation in another area, provided suitable supervision is available.

You should discuss your choice of dissertation topic with your personal tutor or with the programme director by the end of the second semester at the latest. You will normally commence work on your dissertation immediately after the May/June examination period, although some preliminary reading may be done during the second semester.

For Diploma students, the report involves writing a more limited account on a topic of mathematical interest. Normally you will write your report on a topic related to that in your project, and your project supervisor will normally supervise your report. Details about how to submit the dissertation and deadlines for doing so are given below in Section B.
MSc Statistics

- **Aims of the programme**

The aims of the M.Sc. programme are to offer students thorough professional high quality training in Statistics preparing students for work as Statisticians in business, industry, education, medicine, government and scientific research establishments.

The emphasis is on providing a good general coverage of the subject. Its principle strength lies in that it provides training in the practical side of the subject as well as providing a thorough appreciation of the theory underpinning the methodology thus developing each student’s ability in solving substantial and realistic statistical problems, communicating effectively the findings and in developing new techniques.

The aims of the Diploma programme are to offer students training in Statistics which will prepare them to work with other Statisticians in business, industry, education, medicine and government.

The aims of the Diploma differ from those of the M.Sc. in that the breadth of coverage of subjects is not as wide as that of the M.Sc.

- **Intended Learning Outcomes of the programme**

On successful completion of the course M.Sc. and Diploma students will have:

- acquired the knowledge and skills of applying and adapting statistical theory and modelling techniques to real life problems in both observational and designed studies;
- acquired skills in dimensionality reduction, classification, multivariate inferential methods of multivariate data;
- acquired, through the Data Analysis part of the course and the project work, both analytical and computational skills involving the use of statistical computer packages to enable them to tackle a broad range of statistical analyses and communicate the results of them clearly;
- acquired and shown skills in completing an extended individual study of a statistical problem and of presenting the results in a dissertation;
- developed attitudes and confidence which will allow them to acquire new statistical knowledge and expertise throughout a future career in statistics.

In addition, on successful completion of the course, M.Sc. students will have

- an appreciation of the general principles of statistical inference and their implications in data analysis;

- **Structure of the Programme**

Students chose 120cr of courses across 2 semesters (Full Time) or across 4 semesters (Part Time) from the following lists:

You must select the following courses:

### Mandatory:

- **Semester 1**
  - MATH68001 Statistical Inference  
  - MATH68011 Linear Models with Nonparametric Regression  
  - MATH68091 Statistical Computing  
  - MATH68061 Multivariate Statistics  
  - Exam Dates: 16th - 27th January 2012

- **Semester 2**
  - MATH68052 Generalised Linear Models and Survival Analysis  
  - MATH68772 Data Analysis II  
  - Exam Dates: 17th May - 6th June 2012
Optional:
Semester 2
MATH68032  Time Series Analysis
MATH68082  Design with Advanced Topics
MATH68122  Computationally Intensive Statistics
MATH68132  Longitudinal Data Analysis
Exam Dates: 17th May - 6th June 2012

You must also be registered for your dissertation:
MATH68150  MSc Statistics Dissertation OR
MATH68170  Diploma Statistics Dissertation

and you must undertake the compulsory Health and Safety course via Blackboard. MATHS0000

You will have a total of 180cr for the MSc. Should you wish to audit extra courses, then please speak to your Programme Director.

Students may, depending on their background and with the permission of the programme director, replace some of these units with other units offered in the School.
M.Sc./Diploma Theoretical and Applied Fluid Dynamics

• Programme Aims

The major aims of the programme are:

(i) to produce high quality graduates satisfying the national need for scientists and engineers with specialist training in fluid dynamics who will be suitable for employment in the aerospace, mechanical, civil, chemical, offshore and water engineering industries;

(ii) to provide graduate mathematicians and engineers, the appropriate training in various aspects of theoretical, computational and experimental fluid dynamics, as well as personal transferable and IT skills, to enable them to use their expertise more effectively in industries where fluid dynamics is important;

(iii) to introduce students from an engineering, mathematics, or a physical sciences discipline, to modern developments in fluid dynamics and to give them a good background in theoretical, computational and experimental fluid dynamics.

• Programme Objectives and intended learning outcomes.

• Intended learning outcomes for Diploma

On successful completion of the programme students will:

(a) be familiar with a range of subjects covering incompressible and compressible fluid flow, laminar and turbulent boundary layers, turbulence modelling, wave mechanics including acoustics and shallow water flows, environmental and geophysical flows, and computational fluid dynamics.

(b) be familiar with the use of asymptotic methods in fluid dynamics.

(c) have learnt a variety of computational techniques involving code writing as well as using packages for solving fluid dynamics problems.

(d) have some familiarity with experimental techniques and methodologies, and be able to perform experiments.

(e) gain exposure to IT packages and training in personal transferable skills.

• Intended learning outcomes for M.Sc.

In addition to the objectives (a)-(e) above, an additional objective for the M.Sc. is that on successful completion of the M.Sc. students will

(f) be capable of conducting a research programme (under supervision) and produce a written report of the research containing either new and original results which may be suitable for publication, or a comprehensive review of previous related work showing in depth understanding and critical appraisal of the research area.

• Programme Content and Structure

The programme of training consists of a number of conventional lecture course modules, laboratory based modules, (for experimental work) modules with a significant project element (for computational work) and a substantial research project.

Students chose 105cr of courses across 2 semesters from the following lists:

You must select the following courses:

Mandatory:
MATH 65740 Research Skills (15cr) * assessed by coursework only

Semester 1
MATH64011 Asymptotic Expansions and Perturbation Methods (15cr)
MATH65111 Compressible & Incompressible Fluid Dynamics (15cr)
MATH69111 Scientific Computing (15cr)

Exam Dates: 16th - 27th January 2012

Semester 2
MACE 63002 Computational Hydraulics (15cr)

Exam Dates: 17th May - 6th June 2012

Optional:
Please select 30cr from the following options:

Semester 2:
MATH65122 Linear and Nonlinear Waves (15cr)
MATH65132 Hydrodynamic Stability Theory (15cr)
MATH65142 Introduction to Combustion Theory (15cr)

Exam Dates: 17th May - 6th June 2012

You must also be registered for your dissertation/diploma project:
MATH 60090 MSc Dissertation (60cr) due 7th September 2012  OR
MATH 60100 PG Diploma project (15cr) due 1st July 2012

and you must undertake the compulsory Heath and Safety course via Blackboard.  MATHS0000

You will have a total of 180cr for the MSc.  Should you wish to audit extra courses, then please speak to your Programme Director.

- Project Arrangements

Students who have completed the taught part of the programme proceed to the dissertation/report stage. This involves working closely with a member of staff, the project supervisor, on a research topic and writing and submitting a dissertation/report. Students choosing a project with an industrial partner would have an additional industrial supervisor. A list of available projects is usually circulated in February and students are free to choose a project from this list. Work on the chosen project can begin as soon as the project is chosen.

Both students and project supervisors have certain responsibilities and the Graduate school encourages students to establish formal meetings with the advisor and project supervisor present and to keep records of such meetings.
Health and Safety

Primary medical care of students is provided by the National Health Service through individual registration of students with a local general practitioner of their choice.

- **The Student Counselling Service** provides confidential, individual counselling for all work related difficulties, exam anxiety, stress and other personal problems. The service is located on the Fifth Floor of Crawford House, and can be contacted by dialling 0161 275 2864. The e-mail address is counsel.service@manchester.ac.uk. Further information can be found at the following website:

  http://www.manchester.ac.uk/counselling

You should ensure that you are acquainted with the various Safety Regulations and, in particular, the correct procedure in the event of a fire. The School’s Health and Safety Policy is available via the School intranet: https://www.maths.manchester.ac.uk/intranet/ You should ensure that you read and understand this document.

The University’s Health and Safety web address is:

http://www.campus.manchester.ac.uk/healthandsafety/index.htm

- **Fire Safety**

  Fire is a ubiquitous hazard that affects everybody in the University. In general, the risk of a fire starting in an office environment where there is a no smoking policy is very low. However, everyone should make every effort to prevent it from occurring, for example, by reporting electrical defects, accumulations of combustible materials, or evidence of covert smoking.

  The School procedure in the event of a fire or other emergency is that everybody is to leave the building promptly using the stairs and the nearest exit, and assemble at the assembly area, which is next to the University Place. Following an evacuation, do not re-enter the building unless instructed it is safe to do so by Fire Service personnel or university security staff.

  The alarm system is tested every Monday afternoon at 13:50. There is no need to evacuate the building on these occasions, although reports of alarms that are too faint, or where the meaning of the alarm is not clear, should be made immediately to the School Safety Adviser (SSA), Mr. Eamon Griffin.

  Anybody who has difficulties responding in an emergency evacuation situation should discuss this with the SSA.

- **Fire Information**

  If the fire alarm sounds continuously, then the building must be evacuated immediately by the nearest exit. Lifts must not be used. The fire alarm system will cause all lifts to travel to the ground floor where the doors will open to allow any occupants to exit. The doors will then close and will remain in that state until overridden by the fire brigade, or until the system is reset.

  Pulsed sounders mean there is no need to evacuate, but be prepared to evacuate should the sounders change to continuous. (Pulsed sounders are not a signal to evacuate, but serve as an indication of a fire alarm in the adjacent building.)

  Anybody who would have difficulty leaving the building via the staircases during an evacuation should make their way to one of the landing areas in the stairwells, where there are marked refuge areas. An intercom station is located there that communicates with a station situated in the reception area. This will enable the location to be established and assistance provided to exit the building.

  Please inform the SSA if you may need this type of assistance.

- **Disabled Toilet Alarms**

  All alarms are activated by a red pull-cord switch. This sounds a local alarm as well as illuminating a red light outside the cubicle. An alarm will also sound on a control panel in the reception area.

  The alarm can be reset locally by pressing the RESET button in the cubicle.

- **First Aid**
If you need to use the First Aid services listed below, please use the nearest one to where you are.

<table>
<thead>
<tr>
<th>Location</th>
<th>Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxford Road end of campus</td>
<td>From local first aiders (see table below).</td>
</tr>
<tr>
<td>In an emergency and outside working hours</td>
<td>Contact Security (telephone 69966)</td>
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- **Health and Safety Staff (First Aiders)**

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>E-mail Address</th>
<th>External Number</th>
<th>Mobile Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Aider</td>
<td>Mrs. Francesca Moss</td>
<td><a href="mailto:Francesca.Moss@manchester.ac.uk">Francesca.Moss@manchester.ac.uk</a></td>
<td>0161 275 5899</td>
<td>-</td>
<td>Alan Turing, G.204</td>
</tr>
<tr>
<td>First Aider</td>
<td>Mr. Sebastian Rees</td>
<td><a href="mailto:Sebastian.Rees@manchester.ac.uk">Sebastian.Rees@manchester.ac.uk</a></td>
<td>0161 275 5812</td>
<td>-</td>
<td>Alan Turing, 1.205</td>
</tr>
</tbody>
</table>

First Aid boxes are situated at the Alan Turing Building Attendants’ Lodge.

Additional Occupational Health Services for Staff and Students are located at 182-184 Waterloo Place, near the University Precinct Centre, Telephone 0161 275 2858. (First Aid is not provided here.)

http://www.campus.manchester.ac.uk/healthandsafety/studentOH.htm#services

If an ambulance is required, it can be summoned by dialling 999 from any telephone. Make sure you inform the Building Attendants so that they can direct the medical personnel to the incident.

It should be noted that all university work places are designated as non-smoking and it is illegal to smoke within University buildings and enclosed space.

Any damage to a building or other defects must be reported to the SSA immediately. If the SSA is not available, inform one of the Building Attendants.

Some students have disabilities which would hinder their escape from a building in case of emergency, while others may have hearing difficulties which impair their ability to notice emergency alarms. The School makes prior arrangements for the safety in emergency situations of any of its students with a disability and it is important that students know precisely what they should do, and with whose help in an emergency such as a fire evacuation. Students with disabilities should introduce themselves to the School Disability Coordinator (Stephanie Keegan Room G.204, Alan Turing Building) as soon as possible after arrival, and in any case within the first week, and confirm the arrangements that have been made for their safety.

If you have an accident when you are on University premises then you must inform Mr. Eamon Griffin or the staff in the PG Office (behind reception on the ground floor of the Alan Turing Building).

- **Buildings**

The buildings are open from 8.30am to 5.30pm weekdays. Graduate students who are working very late or at weekends are advised to notify the Security Office (ext. 52728). The vicinity of the buildings should not be considered completely safe at night, particularly for unaccompanied women.

In accordance with University policy, smoking is prohibited throughout the buildings, within any door entrance or access ramp.

- **Useful web addresses**

The University Health and Safety Web Site can be found at:

http://www.campus.manchester.ac.uk/healthandsafety/

Here you will find useful information about Health and Safety within the University, along with the University's Health and Safety Policy

Counselling for help and advice on personal matters:

http://www.sos.eps.manchester.ac.uk/support/atoz/counselling.html

Disability Support – Help for disabled students http://www.staffnet.manchester.ac.uk/personalsupport/disability/
Central Services

- **Student Services Centre**

  The Student Services Centre (SSC) is the main point of contact for most of the administrative tasks you need to carry out during your time here as a student, including registration, assessment and payment of tuition fees, issue of swipe cards, examinations information and timetabling, student loan and grant enquiries, financial assistance, issue of official documents (such as academic transcripts, certificates, confirmation of award letters, Council Tax exemption certificates), and enquiries about graduation. The SSC is located on Burlington Street and there is also a Satellite Centre on the ground floor of Staff House on the Sackville Street site. The Student Services Centre is open five days a week from 10 am to 4 pm although the Satellite Centre is only open on Monday to Thursday. The contact details for the Student Services Centre are:

  Tel: 0161 275 5000.
  E-mail: ssc@manchester.ac.uk

- **Crucial Guide**

  The Crucial Guide contains essential advice, information and guidance for students at the University of Manchester. It covers academic life (including disability support, advice for international students and examination timetables), financial life (including tuition fees, student loans and scholarship information), city life, personal life (including advice on how to manage ill health and cope with personal and academic problems) and university life. The Crucial Guide Live can be found at the website:

  http://www.studentnet.manchester.ac.uk/crucial-guide/

- **Students’ Union Advice Centre**

  The Students’ Union Advice Centre is similar to a Citizens Advice Bureau, although there is greater emphasis on those problems that particularly affect students. It can offer advice on finance and housing, for example, as well as advice on areas relating to overseas students (such as visa and immigration problems).

  The Students’ Union Advice Centre is located on the first floor of the Steve Biko Building (Students’ Union Building on the Oxford Road site). It is open from 9.30 am to 4:30 pm on Monday to Friday. Tel: 0161 275 2947. Further information can be found at the website:

  http://www.umsu.manchester.ac.uk/advice

- **Disability Support Office**

  Students wishing to be considered for disability support provision in relation to their studies should contact the University’s Disability Support Office (DSO). The DSO can organise a wide range of individual practical support and can assist you to access external resources like the Disabled Students Allowance. The DSO is situated on the second floor of University Place, Block 2. Tel: 0161 275 7512 / 8518. The e-mail address is dso@manchester.ac.uk. Further information can be found at the following website:

  http://www.studentnet.manchester.ac.uk/crucial-guide/academiclife/support/disability-support/

- **Student Guidance Service**

  This is a confidential service of information and advice and offers an opportunity for students to discuss any matters that may be affecting academic progress. These might include interruptions, withdrawals or changing degree programme, or a personal matter outside the University that is affecting your academic progress. The Student Guidance Service is situated on the first floor of University Place and the contact details are as follows:

  Tel: 0161 275 3033
  Website: http://www.studentnet.manchester.ac.uk/crucial-guide/sgs/
  E-mail: sgs@manchester.ac.uk

- **Accommodation Office**

  The Accommodation Office, located on the first floor of University Place, is responsible for all Halls of Residence and University Leased Houses. It can also offer advice, including legal rights for tenants.

  Tel: 0161 275 2888.
Manchester Student Homes is an Accommodation Bureau. It assists students with private sector accommodation. You can view property details by visiting Manchester Student Homes, which is located in Unit 1-3, Ladybarn House, Moseley Road, Fallowfield, Manchester M14 6ND (Tel: 0161 275 7680).

Alternatively, Manchester Student Homes provides students with a free, online, Virtual Housing Bureau. Comprehensive details of thousands of properties are provided on Manchester Student Homes’ website at: http://www.manchesterstudenthomes.com

- Careers Service

The Careers Service is located in Crawford House on Booth Street East (Tel: 0161 275 2828). The Careers Service gives careers guidance and provides details of jobs available for graduates. Comprehensive careers and employer information can be found at the website: http://www.careers.manchester.ac.uk/students

The Careers Service can also provide advice on finding work experience, as well as details of relevant work experience schemes and sources of vacancies. As well as providing extra funding, work experience will help you develop the personal work-related skills critical to your career success, test your ability and knowledge in a real work setting, demonstrate your skills to potential future employers and add valuable experience to your CV. Further information about work experience can be found at the website: http://www.careers.manchester.ac.uk/students/jobsearch/workexperience/

Contact details for some other useful student support services are listed below:

- Childcare

There are two nurseries associated with the University. Their contact details are:
Dryden Street Nursery, Chorlton-on-Medlock, Manchester M13 9AU.
Tel: 0161 272 7121
E-mail: admin.drydenstreetnursery@btconnect.com
Echoes Nursery, Echo Street (off Granby Row), Manchester M60 1QD.
Tel: 0161 306 4979
E-mail: echoes@networknurseries.co.uk
Further information for student-parents may be found at the website:
http://www.studentnet.manchester.ac.uk/crucial-guide/universitylife/student-parents/

- Mature Students

The Burlington Society is the University society for mature and postgraduate students. It is based in the Burlington Rooms, next to the John Rylands University Library.
The Students’ Union also has a dedicated Mature Students and Postgraduate Students Adviser, whom you can approach about any concerns or issues. Further information for mature students may be found at the website:
http://www.studentnet.manchester.ac.uk/crucial-guide/universitylife/
mutual-support-groups/mature-students/

- Nightline

This is a confidential listening and information service (run by the Students’ Union), offering a point of contact through the night in semester time.
Tel: 0161 275 2983/4
(The number is on the back of your library card.)

- Religious Support

Details of services, facilities and all places of worship (Christian and non-Christian) adjacent to the University are available at:
St. Peter’s Chaplaincy
St. Peter's House
Precinct Centre, Oxford Road.
Tel: 0161 275 2894
E-mail: sph.reception@man.ac.uk
Website: http://www.stpeters.org.uk/

Roman Catholic Chaplaincy
Avila House, 335-339 Oxford Road.
Tel: 0161 273 1456
E-mail: info@rc-chaplaincy-um.org.uk
Website: http://www.rc-chaplaincy-um.org.uk
Guidance to Students on Plagiarism and other forms of Academic Malpractice.

Definition of academic malpractice

Academic malpractice is any activity – intentional or otherwise – that is likely to undermine the integrity essential to scholarship or research. It includes plagiarism, collusion, fabrication or falsification of results, and anything else that could result in unearned or undeserved credit for those committing it. Academic malpractice can result from a deliberate act of cheating or may be committed unintentionally. Whether intended or not, all incidents of academic malpractice will be treated seriously by the University (taken from ‘Academic Malpractice: Guidelines on the Handling of Cases’ produced by the Student Support and Services Office - http://www.campus.manchester.ac.uk/medialibrary/policies/academic-malpractice.pdf)

Introduction

1. As a student you are expected to cooperate in the learning process throughout your programme of study by completing assignments of various kinds that are the product of your own study or research. You must ensure that you are familiar with, and comply with, the University’s regulations and conventions: ignorance of the University regulations and conventions cannot be used as a defence for plagiarism or some other form of academic malpractice

2. This guidance is designed to help you understand what we regard as academic malpractice and hence to help you to avoid committing it. You should read it carefully, because academic malpractice is regarded as a serious offence and students found to have committed it will be penalized. A range of penalties may be applied including the capping of marks, being awarded zero (with or without loss of credits), failing the whole unit, being demoted to a lower class of degree, or being excluded from the programme.

3. In addition to the advice that follows, your School will give you advice on how to avoid academic malpractice in the context of your discipline. It will also design assessments so as to help you avoid the temptation to commit academic malpractice. Finally, you should take note that work you submit may be screened electronically to check against other material on the web and in other submitted work.

Plagiarism

4. Plagiarism is presenting the ideas, work or words of other people without proper, clear and unambiguous acknowledgement. It also includes ‘self plagiarism’ (which occurs where, for example, you submit work that you have presented for assessment on a previous occasion), and the submission of material from ‘essay banks’ (even if the authors of such material appear to be giving you permission to use it in this way). Obviously, the most blatant example of plagiarism would be to copy another student’s work. Hence it is essential to make clear in your assignments the distinction between:

• the ideas and work of other people that you may have quite legitimately exploited and developed, and

• the ideas or material that you have personally contributed.

5. To assist you, here are a few important do’s and don’ts:

• Do get lots of background information on subjects you are writing about to help you form your own view of the subject. The information could be from electronic journals, technical reports, unpublished dissertations, etc. Make a note of the source of every piece of information at the time you record it, even if it is just one sentence.

• Don’t construct a piece of work by cutting and pasting or copying material written by other people, or by you for any other purpose, into something you are submitting as your own work. Sometimes you may need to quote someone else’s exact form of words in order to analyse or criticize them, in which case the quotation must be enclosed in quotation marks to show that it is a direct quote, and it must have the source properly acknowledged at that point. Any omissions from a quotation must be indicated by an ellipsis (…) and any additions for clarity must be enclosed in square brackets, e.g. “[These] results suggest… that the hypothesis is correct.” It may also be appropriate to reproduce a diagram from someone else’s work, but again the source must be explicitly and fully acknowledged there. However, constructing large chunks of documents from a string of quotes, even if they are acknowledged, is another form of plagiarism.

• Do attribute all ideas to their original authors. Written ‘ideas’ are the product that authors produce. You would not appreciate it if other people passed off your ideas as their own, and that is what plagiarism rules are intended to prevent. A good rule of thumb is that...
each idea or statement that you write should be attributed to a source unless it is your personal idea or it is common knowledge. (If you are unsure if something is common knowledge, ask other students: if they don’t know what you are talking about, then it is not common knowledge!)

6. As you can see, it is most important that you understand what is expected of you when you prepare and produce assignments and that you always observe proper academic conventions for referencing and acknowledgement, whether working by yourself or as part of a team. In practice, there are a number of acceptable styles of referencing depending, for example, on the particular discipline you are studying, so if you are not certain what is appropriate, ask your tutor or the course unit coordinator for advice! This should ensure that you do not lay yourself open to a charge of plagiarism inadvertently, or through ignorance of what is expected. It is also important to remember that you do not absolve yourself from a charge of plagiarism simply by including a reference to a source in a bibliography that you have included with your assignment; you should always be scrupulous about indicating precisely where and to what extent you have made use of such a source.

7. So far, plagiarism has been described as using the words or work of someone else (without proper attribution), but it could also include a close paraphrase of their words, or a minimally adapted version of a computer program, a diagram, a graph, an illustration, etc taken from a variety of sources without proper acknowledgement. These could be lectures, printed material, the Internet or other electronic/AV sources.

8. Remember: no matter what pressure you may be under to complete an assignment, you should never succumb to the temptation to take a ‘short cut’ and use someone else’s material inappropriately. No amount of mitigating circumstances will get you off the hook, and if you persuade other students to let you copy their work, they risk being disciplined as well (see below).

Collusion
9. Collusion is any agreement to hide someone else’s individual input to collaborative work with the intention of securing a mark higher than either you or another student might deserve. Where proved, it will be subject to penalties similar to those for plagiarism. Similarly, it is also collusion to allow someone to copy your work when you know that they intend to submit it as though it were their own and that will lay both you and the other student open to a charge of academic malpractice.

10. On the other hand, collaboration is a perfectly legitimate academic activity in which students are required to work in groups as part of their programme of research or in the preparation of projects and similar assignments. If you are asked to carry out such group work and to collaborate in specified activities, it will always be made clear how your individual input to the joint work is to be assessed and graded. Sometimes, for example, all members of a team may receive the same mark for a joint piece of work, whereas on other occasions team members will receive individual marks that reflect their individual input. If it is not clear on what basis your work is to be assessed, to avoid any risk of unwitting collusion you should always ask for clarification before submitting any assignment.

Fabrication or falsification of results
11. For many students, a major part of their studies involves laboratory or other forms of practical work, and they often find themselves undertaking such activity without close academic supervision. If you are in this situation, you are expected to behave in a responsible manner, as in other aspects of your academic life, and to show proper integrity in the reporting of results or other data. Hence you should ensure that you always document clearly and fully any research programme or survey that you undertake, whether working by yourself or as part of a group. Results or data that you or your group submit must be capable of verification, so that those assessing the work can follow the processes by which you obtained them. Under no circumstances should you seek to present results or data that were not properly obtained and documented as part of your practical learning experience. Otherwise, you lay yourself open to the charge of fabrication or falsification of results.

Finally...
12. If you commit any form of academic malpractice, teaching staff will not be able to assess your individual abilities objectively or accurately. Any short-term gain you might have hoped to achieve will be cancelled out by the loss of proper feedback you might have received, and in the long run such behaviour is likely to damage your overall intellectual development, to say nothing of your self esteem. You are the one who loses.
## Staff Contact Details

<table>
<thead>
<tr>
<th>NAME</th>
<th>Title</th>
<th>EMAIL @manchester.ac.uk</th>
<th>PHONE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrahams</td>
<td>I David (Prof. (Bayer chair))</td>
<td>David.Abrahams</td>
<td>0161 27 55901</td>
<td>Alan Turing 2.244</td>
</tr>
<tr>
<td>Aczel</td>
<td>Peter H (Prof. (Emeritus))</td>
<td>Peter.Aczel</td>
<td>0161 27 57285</td>
<td>Alan Turing 2.233</td>
</tr>
<tr>
<td>Bagley</td>
<td>Jonathan Dr</td>
<td>Jonathan.Bagley</td>
<td>0161 30 63662</td>
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<tr>
<td>Baker</td>
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<td>Yuri Dr</td>
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<td>Bellamy</td>
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<tr>
<td>Bigland</td>
<td>Anna Mrs (PG Admin)</td>
<td>Anna.Bigland</td>
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<tr>
<td>Blackburn</td>
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<td></td>
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<tr>
<td>Borovik</td>
<td>Alexandre Prof.</td>
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<td>Boshnakov</td>
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<tr>
<td>Bown</td>
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<td>Broom</td>
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<td>Broomhead</td>
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<tr>
<td>Bujorianu</td>
<td>Manuela Dr (Research Assoc.)</td>
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<tr>
<td>Chahlaoui</td>
<td>Younes Dr (Research Assoc.)</td>
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<tr>
<td>Coghan</td>
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<tr>
<td>Coleman</td>
<td>Mark Dr</td>
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<tr>
<td>Cotterill</td>
<td>Phil Dr (Hon. Research Fellow)</td>
<td>Philip.Cotterill</td>
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<td>Daou</td>
<td>Joel Dr</td>
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<td>Doid</td>
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<td>John.Dold</td>
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<td>A.N.Doney</td>
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### 2011-12 School of Mathematics Postgraduate Taught Programmes Handbook

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APPENDIX 3

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For details of the University’s policy on this matter visit the website:

http://www.ipresource.manchester.ac.uk/understandingip/universitypolicy/policy/ip_policy.html
APPENDIX 4
Ordinances and Regulations: Degree of Master, Postgraduate Diploma and Postgraduate Certificate
For students registered from September 2010 onwards

ORDINANCES

1. The University may award the taught degrees of Master, Postgraduate Diplomas and Postgraduate Certificates in accordance with the General Regulation XI.

2. Regulations for the degrees of Master of Enterprise (MEnt), Master of Philosophy (MPhil), Master of Research (MRes), Master of Science (MSc) by Research and Master of Surgery (ChM) are published separately.

3. Regulations for integrated Degree of Master are published with the Regulations for Undergraduate Programmes.

4. Students for the above degrees, postgraduate diplomas and postgraduate certificates will pursue satisfactorily an approved programme of advanced study, as either a full or part-time student.

5. These ordinances and regulations provide a general framework for all taught postgraduate degrees, diplomas and certificates, and should be read in conjunction with detailed notes for guidance and programme specific regulations.

6. Regulations for Conduct and Discipline of Students, Student Complaints Procedures, Academic Appeals, and Work and Attendance of Students are provided in the University’s General Regulations, XVII, XVIII, XIX and XX respectively.

B. REGULATIONS

1. Admission to the Programme

a. Applicants for admission to the Degree of Master and Postgraduate Diploma will normally have:
   • a first degree (equivalent to a UK Honours Bachelors degree) or equivalent qualification from a recognised institution;
   or
   • evidence of previous advanced study, research or professional experience, which the University accepts as qualifying the applicant for entry.

b. Applicants for admission to the Postgraduate Certificate will normally have:
   • evidence of academic qualifications or work experience which meets the approval of the University and allows them to be registered onto a Certificate programme or individual postgraduate course units.

c. All applicants must meet the minimum English language requirements of their chosen programme, as described by the University’s Postgraduate Admissions Policy.

d. Students may be registered initially for the Postgraduate Diploma or Postgraduate Certificate. After successfully completing the required assessment, they may be permitted to progress to the Degree of Master or Postgraduate Diploma respectively.

e. A student awarded the Postgraduate Certificate may subsequently be permitted to use the credits awarded to count towards an appropriate Postgraduate Diploma or a Degree of Master, but only on condition that:
   • the student achieved a pass mark of 40% or more to proceed with the Postgraduate Diploma, or 50% or more to proceed with the Degree of Master;
   • all other requirements for progression as stated in section 5 have been met;
   • the student has not previously been examined for the dissertation (or equivalent) element of the programme;
   • the award of the Postgraduate Certificate is rescinded.

In these circumstances, for a Postgraduate Diploma, students will normally be required to complete the programme no more than four academic years after initial registration, or for a Degree of Master, no more than five academic years after initial registration.

f. A student awarded the Postgraduate Diploma may subsequently be permitted to use the credits awarded to count towards an appropriate Degree of Master, but only on condition that:
• the student achieved a pass mark of 50% or;
• all other requirements for progression as stated in section 5 have been met;
• the student has not previously been examined for the dissertation (or equivalent) element of the programme;
• the award of the Postgraduate Diploma is rescinded.

In these circumstances students will normally be required to complete the programme no more than five academic years after initial registration

2. Duration of Programme

a. A Degree of Master will normally be a one-year programme equating to 45 teaching weeks within a 51 week period and the date for the end of the programme and submission of the dissertation (or equivalent) will be published in the programme handbook.

b. A part-time Degree of Master student will complete the programme over a more extended period of time which will be published in the programme handbook, but will not exceed five academic years.

c. A Postgraduate Diploma will be a full-time or part-time programme that will normally extend over not less than two academic semesters and will not exceed four academic years.

d. A Postgraduate Certificate will be a full-time or part-time programme that will normally extend over not less than one academic semester and will not exceed two academic years.

e. Programmes may be of longer full-time duration where there is an increase in the credit requirements (see 3d).

3. Credits

a. A Degree of Master of one year full-time (or equivalent part time) duration will consist of a minimum of 180 credits, of which at least 150 will be at level 4 (level 7 in the FHEQ) with the remainder at level 3 (level 6 in the FHEQ)*.

b. A Postgraduate Diploma will consist of a minimum of 120 credits, of which at least 90 will be at level 4 (level 7 in the FHEQ) with the remainder at level 3 (level 6 in the FHEQ).

c. A Postgraduate Certificate will consist of a minimum of 60 credits at level 4 (level 7 in the FHEQ).

d. For longer programmes, the total credit requirements for each award are increased pro rata to the length of the programme.

e. All course units will normally be of 15 credits, or multiples thereof. A Degree of Master will normally include a dissertation of at least 60 credits or, for specific programmes (e.g. Professional Masters) and by institutional approval, this may be replaced by an agreed alternative structure of teaching, learning and assessment which achieves equivalent level learning outcomes. A Postgraduate Diploma may include a project or extended essay of no more than 30 credits. The Postgraduate Certificate will not normally include a dissertation or project element.

* The FHEQ levels referred to are taken from the QAA Framework for Higher Education Qualifications: (http://www.qaa.ac.uk/academicinfrastructure/FHEQ/EWN108/default.asp)

4. Accreditation of Prior Learning (APL)

a. A student may be permitted to receive an award of credits on the basis of demonstrated learning that has occurred at some point in the past and is appropriate to the programme both in content and currency. The award of credits can be based upon learning for which certification has been awarded by an educational institution or another education/training provider or uncertificated learning gained from experience.

b. All APL applications will be approved in line with the University’s overall policy on the award of APL, as follows:

• A Degree of Master will normally allow a maximum of 60 APL credits. APL credits will not count towards the dissertation (or equivalent) or project components.

• A Postgraduate Diploma will normally allow a maximum of 30 APL credits. APL credits will not count towards the dissertation (or equivalent) or project components.
• A Postgraduate Certificate will normally not allow any APL credit.

c. Any unit thus exempted will not be awarded a mark but will be graded pass and hence excluded from the calculation of the overall mark.

5. Progression and Assessment

a. Regulations for work and attendance are outlined in the University’s General Regulations, XX.

b. Students for the Degree of Master, Postgraduate Diploma or Postgraduate Certificate will present themselves for assessment of their progress as required in the programme handbook.

c. Students will normally successfully complete the taught component of the Degree of Master before they can progress to the dissertation (or equivalent), and must successfully complete the taught component before submission of the dissertation (or equivalent).

d. The pass mark for a Degree of Master will be 50%.

e. The pass mark for a Postgraduate Certificate and a Postgraduate Diploma will be 40%. A pass mark of 50% may be approved by the Faculty where required on discipline-specific grounds or for some professionally accredited programmes.

f. A student registered on a Postgraduate Diploma or Masters programme who fails to satisfy the Examiners in any assessment of taught units may be permitted to resubmit the assessment or retake the examination on one further occasion, up to a maximum of 45 credits. The student will take this opportunity during the next available University examination period or within a period as published in the programme handbook.

A student registered on a Postgraduate Certificate programme who fails to satisfy the Examiners in any assessment of taught units may be permitted to resubmit the assessment or retake the examination on one further occasion, up to a maximum of 30 credits. The student will take this opportunity during the next available University examination period or within a period as published in the programme handbook.

g. The maximum mark to be awarded for resubmitted coursework or retaken examination will normally be 50% for the Degree of Master and 40% for the Postgraduate Diploma (or 50% where the higher pass mark has been approved). This mark will be used in computing the overall mark for the course unit.

h. All Degrees of Master will normally have exit points for the award of a Postgraduate Certificate and a Postgraduate Diploma. These will be clearly defined in terms of level of achievement and will correspond to 60 and 120 credits respectively. Students who do not achieve the required pass mark in the taught element for the Degree of Master, but who do achieve the required pass mark for a Postgraduate Diploma or Certificate, may be awarded a Postgraduate Diploma or Certificate, as appropriate, provided they have successfully completed the requisite number of credits including no more than the maximum number of credits allowed as APL for the exit award under 4b.

i. Students may, in exceptional mitigating circumstances, and with prior permission of the Faculty, be allowed to re-take the entire programme subject to all outstanding fees being paid.

j. Students may be awarded a compensated pass for a Degree of Master when they fail in units of the taught component totalling no more than 30 credits and receive a mark of at least 40% but less than 50% for those failed units. The student must also have gained an overall mark, calculated as an average of the numerical marks awarded for each unit weighted by the credits for that unit (referred to subsequently as “weighted average”), for all taught units of 50% or more in order to be granted the compensated pass.

k. Students may be awarded a compensated pass for a Postgraduate Diploma programme when they fail in units totalling no more than 30 credits and receive a mark of at least 30% but less than 40% for those failed units. The student must also have gained an overall weighted average for all taught units of 40% or more in order to be granted the compensated pass. Where the pass mark is set at 50% the compensatable units must receive a mark of at least 40% but less than 50%.

l. Students may be awarded a compensated pass for a Postgraduate Certificate programme when they fail in units totalling no more than 15 credits and receive a mark of at least 30% but less than 40% for those failed units. The student must also have gained an overall weighted average for all taught units of 40% or more in order to be granted the compensated pass.

m. The maximum allowable cumulative failure of course units in a Masters programme at the first attempt is 45 credits of the taught component of the programme. A student whose failures in units at the first attempt exceed 45 credits will be deemed to have failed the programme.
n. Students who fail in units totalling more than 45 credits at Masters level will be judged against the requirements for a pass on the Postgraduate Diploma programme. If this results in their failing units totalling fewer than or equal to 45 credits at Postgraduate Diploma level, the student may resit those units failed at Postgraduate Diploma level to obtain the award of a Postgraduate Diploma.

o. Students exiting with a Postgraduate Diploma or Postgraduate Certificate will be permitted to rescind this award and upgrade to a Masters (or Postgraduate Diploma) by successfully completing the appropriate research (or further taught) component of the programme providing the following conditions are met:

- The rescinding occurs within five years of the original registration to the programme
- An overall mark of 50% or above was obtained for the Postgraduate Diploma (or Postgraduate Certificate) including any capped or compensated marks in the average mark calculation.

p. Faculties may allow Schools on discipline-specific grounds to adopt more stringent requirements, including (but not restricted to):

- specifying core units for which no compensatable fail mark will be available;
- increasing the proportion of the total credit that must reach the pass mark (ultimately to the total credits available, thus allowing no compensatable fails);
- setting a higher pass mark overall.

6. Dissertation (or equivalent)

a. Dissertations should be submitted in accordance with the information set out in the University's Guidance Notes for the Presentation of Dissertations.

b. Dissertation (or equivalent) submission dates will normally be 51 weeks after the start of the programme and will be published in programme handbooks. Submission dates for part-time students will reflect the length of the programme (pro-rata compared to a full-time programme).

c. At the recommendation of the Board of Examiners, students will normally be allowed one resubmission of a failed dissertation (or equivalent), project or extended essay and this will normally be within four months of the date of the publication of the result. Resubmission will not be allowed if the mark is below 40% (where the pass mark is 50%), or 30% (where the pass mark is 40%).

d. Students who achieve a dissertation (or equivalent) mark of at least 40% but less than 50% may accept the award of Postgraduate Diploma with no further work required or resubmit the dissertation (or equivalent) on one occasion, at the discretion of the Board of Examiners, for the award of the Degree of Master. A student achieving a mark below 50% for a resubmitted dissertation (or equivalent) will be awarded a Postgraduate Diploma.

e. The maximum mark to be awarded for resubmitted dissertation (or equivalent), project or extended essay will normally be 50% for the Degree of Master and 40% (or 50% where the pass mark is 50%) for the Postgraduate Diploma.

f. A student may exceptionally be required to attend an examination, orally or otherwise, in the subject of their dissertation (or equivalent), project or extended essay, or a related matter.

7. Recommendation for Award

a. Pass Marks

- To obtain a pass for a Degree of Master, the student is required to obtain both a weighted average of 50% or more on the taught element (after compensation or reassessment as necessary), and 50% or more on the dissertation (or equivalent) (after reassessment as necessary).

- To obtain a pass for a Postgraduate Diploma or Certificate, the student is required to obtain a weighted average of 40% or more on the taught element (after compensation or reassessment as necessary). If there is a project or extended essay a mark of 40% or more (after reassessment as necessary) on this element is also required to pass. A pass mark of 50% for a Postgraduate Diploma may be approved by the Faculty where required on discipline-specific grounds or for some professionally accredited programmes.

- The Faculty will, on report from the Examiners, recommend to Senate the award of the Degree of Master or Postgraduate Diploma or Postgraduate Certificate for those students who have completed all requirements of the regulations and satisfied the Examiners. The awarding certificate will include the title of the programme.

b. Distinction
2011-12 School of Mathematics Postgraduate Taught Programmes Handbook

• A student on a Degree of Master or Postgraduate Diploma programme who has satisfied all the following criteria will be awarded a distinction:

A. A weighted average at first assessment of 70% or more in the taught component of the programme with no mark below 50% in any course unit.  

B. A mark of 70% or more for the dissertation (or equivalent), project or extended essay where this is part of the programme.  

C. A Pass at first assessment in components of the programme where only a Pass/Fail is recorded.  

• Students who have been reassessed in any unit(s), or individual components of any unit(s), or have been granted a compensated pass will not be eligible for the award of distinction.  

• Students on Postgraduate Certificate programmes will not be eligible for the award of distinction.

c. Merit

• A student on a Degree of Master or Postgraduate Diploma programme who has satisfied all the following criteria will be awarded a merit:

A. A weighted average at first assessment of 60% or more in the taught component of the programme with no mark below 50% in any course units.  

B. A mark of 60% or more on the dissertation (or equivalent), project or extended essay where this is part of the programme.  

C. A Pass at first assessment in components of the programme where a Pass/Fail is recorded.  

• Students who have been reassessed in any unit(s), or individual components of any unit(s), or have been granted a compensated pass, will not be eligible for the award of merit.  

• Students on Postgraduate Certificate programmes will not be eligible for the award of merit.
APPENDIX 5

Guidance for the Presentation of Dissertations: Master of Science (MSc) by Research & Master of Enterprise (MEnt)

1. INTRODUCTION

This guidance has been produced for The University of Manchester. Candidates are advised NOT to follow the format of any dissertations previously submitted to the founding institutions (UMIST or The Victoria University of Manchester), as these may have been produced under earlier rules for presentation which are no longer acceptable. Candidates are advised that examiners can and will reject a dissertation if the quantity of typographical errors indicates careless proof-reading.

If any part of what follows is not clear, or if anything in particular is not covered, please contact the appropriate Graduate Office* for advice before the dissertation is bound. Faculty contact details can be found in Appendix 1.

Please note that this document can be provided in a range of alternative formats (e.g. large print) on request from the appropriate Graduate Office.

2. GENERAL INFORMATION

2.1. All dissertations must be written in English; quotations, however, may be given in the language in which they were written. In exceptional circumstances variation of this requirement may be approved by the University for candidates to submit a dissertation predominantly in their language of research. Two identical copies must be submitted in typewritten or printed form on paper of international standard size A4 (210 x 297mm). No other paper size is acceptable for the main text of a dissertation. Paper of a larger size may be used for maps, plans, diagrams or other illustrations forming part of the dissertation if the supervisor agrees that this is required. Where such large sheets are used, or non-paper materials are submitted as part of a dissertation, they must be placed in a pocket inside the back cover of the dissertation or, if substantial, in a separate volume or folder bound and lettered as described in section 4: supplementary items cannot be accepted in any other form.

2.2. A dissertation may include reprints of material published by the candidate as sole or joint author. If reprints are to be bound into the dissertation, they must be included in the dissertation pagination, according to the instructions below, or placed in a pocket inside the back cover of the dissertation.

2.3. Candidates must consult their programme director/supervisor for guidance on the length of the dissertation and for information on submission deadlines.

3. FORMATTING

3.1 Double or 1.5 spacing in a font type and size which ensures readability must be used for the main text (for example 10 point in a font such as Arial, Verdana, Tahoma and Trebuchet or 12 point in Times, Times New Roman, Palatino and Garamond); single spacing may be used for quotations, footnotes and references. Pages may be single or double-sided.

3.2 General guidance on bibliographic citations and references can be obtained from the programme director/supervisor, and must be consistent throughout the dissertation.

3.3 To allow for binding, the margin at the binding edge of any page must be not less than 40mm; other margins must be not less than 15mm.

3.4 Page numbering must consist of one single sequence of Arabic numerals (ie 1, 2, 3 …) throughout the dissertation. Page numbers must be displayed on all pages EXCEPT the title page. The pagination sequence will include not only the text of the dissertation but also the preliminary pages, diagrams, tables, figures, illustrations, appendices, references etc, and will extend to cover all volumes in a multi-volume dissertation. Roman numerals must not be used for page numbering.

4 REQUIRED PAGES

4.1 The following items (a-f) must be included as preliminary pages of the dissertation in the order given.

a. TITLE PAGE

A title page giving:

i. the full title of the dissertation;
ii. a statement as follows: ‘A dissertation submitted to the University of Manchester for the degree of Master of Science by Research/Master of Enterprise in the Faculty of xxx’

iii. the year of submission (not including the month);

iv. the candidate’s name (the same as the name under which he or she is currently registered, or was last registered, at the University); and

v. the name of the candidate’s School.

Please refer to Appendix 2 to see a sample title page.

Where a dissertation consists of more than one volume each volume must contain a title page in the form set out above but including also the appropriate volume number, and the total number of volumes eg Volume I of III.

A dissertation which is referred for re-examination must bear the year of resubmission on both the spine and the title-page and not the year of the original submission; a new Notice of Submission Form and the appropriate fee are always required (refer to the appropriate Graduate Office for details of fees).

b. LIST OF CONTENTS

A list of contents, giving all relevant sub-divisions of the dissertation and a page number for each item.

In a multi-volume dissertation the contents page in the first volume must show the complete contents of the dissertation, volume-by-volume, and each subsequent volume must have a contents page giving the contents of that volume.

The final word count, including footnotes and endnotes, must be inserted at the bottom of the contents page.

c. OTHER LISTS

Lists of tables, figures, diagrams, photographs, abbreviations, etc. If a dissertation contains tables it is recommended that a separate list of each item, as appropriate, is provided immediately after the contents page(s). Such lists must give the page number of each item on the list.

d. ABSTRACT

A short abstract describing the contents of the dissertation. This must be short (not more than 300 words), with emphasis on major observations and deductions rather than on methods. It must be designed to be read independently of the rest of the dissertation and references to the dissertation and other literature will not normally be included.

e. DECLARATION

A declaration stating:

EITHER: that no portion of the work referred to in the dissertation has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning;

OR: what portion of the work referred to in the dissertation has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

f. COPYRIGHT STATEMENT

The following four notes on copyright and the ownership of intellectual property rights must be included as written below:

i. The author of this dissertation (including any appendices and/or schedules to this dissertation) owns any copyright in it (the “Copyright”) and s/he has given The University of Manchester the right to use such Copyright for any administrative, promotional, educational and/or teaching purposes.

ii. Copies of this dissertation, either in full or in extracts, may be made only in accordance with the regulations of the John Rylands University Library of Manchester. Details of these regulations may be obtained from the Librarian. This page must form part of any such copies made.

iii. The ownership of any patents, designs, trade marks and any and all other intellectual property rights except for the Copyright (the “Intellectual Property Rights”) and any reproductions of copyright works, for example graphs and tables (“Reproductions”), which may be described in this dissertation, may not be owned by the author and may be owned by third parties. Such Intellectual Property Rights and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property Rights and/or Reproductions.

iv. Further information on the conditions under which disclosure, publication and exploitation of this dissertation, the Copyright and any Intellectual Property Rights and/or Reproductions described in it may take place is available from the Head of School of [insert name of school].

4.2 OTHER PAGES (not compulsory)

The preliminary pages may also include the following:

a. Dedication, acknowledgement, list of abbreviations and similar: these will normally appear after the compulsory pages listed in section 3 above. Short items may be combined on the same page.
b. It is helpful, particularly to external examiners, if a brief statement is included giving the candidate’s degree(s) and research experience, even if the latter consists only of the work done for this dissertation. This may be untitled or it may be headed ‘Preface’ or ‘The Author’ or similar.

5. BINDING AND PRESENTATION

5.1. The University will accept for examination Master of Science by Research/Master of Enterprise dissertations submitted in temporary soft-binding in addition to submission of dissertation bound in the normal way which is sewn and hard-bound or glued and hard-bound.

5.2. The two approved binding options are listed below. *Dissertations in ring binding, spiral binding or any other non-approved bindings will NOT BE ACCEPTED.*
   a. Standard hard-binding: sewn or glued, with **gold lettering on the spine**.
   b. Temporary soft-binding: acetate or plain card front cover, soft plain card rear cover, glued spine, or channel bound, with **gold lettering on the spine**.

Candidates are advised to consult their programme director as to the preferred option for their programme.

5.3 The spine must be **inscribed in gold lettering** with:
   a. the degree for which the dissertation is submitted;
   b. the name of the candidate;
   c. the year of submission (or resubmission); and
   d. if the dissertation is in two or more volumes, the volume number and the total number of volumes. Please note that it is not recommended that any single volume of a dissertation is thicker than approximately 6cm - if it is greater than this, it is recommended that the dissertation is split into two (or more) volumes.

These must run from the top of the spine as follows. Please note writing on the spine with a gold pen is NOT acceptable:

**Example of spine:**

<table>
<thead>
<tr>
<th>Front Cover</th>
<th>GILBERT K CHESTERTON</th>
<th>Vol I of II</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc/MEnt</td>
<td><em>(OR:)</em></td>
<td><em>(as and if appropriate)</em></td>
<td><em>(at bottom)</em></td>
</tr>
<tr>
<td>MSc/MEnt Dissertation</td>
<td><em>(centred)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(at top)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For further information visit the Teaching and Learning Office website below
APPENDIX 6

Regulation XX - Work and Attendance of Students

[Note: the set of units, practical work and projects required for a degree or other award of the University is referred to as a programme of study (the ‘Programme’). Each such Programme is normally the responsibility of a School (which may also be acting on behalf of a group of Schools), which appoints a body to organise the syllabus, and the teaching and assessment of students. In this Regulation, this body is designated by the term ‘Programme Committee’, recognising that the exact form and title will vary across the University.]

1. The following scheme has been approved by the Senate to determine, subject to the provisions of Regulation XII.9, whether or not a student is working on and attending a Programme satisfactorily for the purposes of Statute XXI.4, and to set out the penalties for failure to work and attend satisfactorily.

2. Individual Schools shall determine the requirements for the work and attendance of students on the Programme to be judged satisfactory. A clear statement of the specific and compulsory requirements for satisfactory work and attendance on the Programme must appear in the Programme Handbook for students, accompanied by a statement of the consequences of failing to meet such requirements.

3. Requirements for work and attendance may include attending lectures, seminars, laboratory classes, field trips, academic and personal tutorials, and other events or meetings concerned with the conduct of the course and progress of students, as well as meeting the specified due dates for the submission of work for comment or assessment, and attending examinations, tests, or other forms of assessment. Schools may rule that students who are late for lectures, seminars, tutorials, practical and other classes may be refused admission to those classes, and that persistent lateness may be deemed to be unsatisfactory attendance.

4. Absence from compulsory classes must be authorised by the appropriate School authority and students are required to provide appropriate certification for absence caused by illness.

5. The Programme Committee shall keep under continuous review throughout the academic year the work and attendance of students for whom it has responsibility under this Regulation.

6. As part of this review, the Programme Committees shall:
   (a) obtain evidence on the progress of students by means of examinations, tests, coursework, reports or such other means of assessment as it considers appropriate; and
   (b) monitor the attendance of the students by such means that it considers to be appropriate.

7. If at any time a Programme Committee has reason to believe that a student’s work and attendance does not at that stage meet the specified requirements, or that he or she may not meet them unless there is an improvement, it shall issue a formal written warning to the student stating the actions he or she is required to take in order to effect the necessary improvement. The warning shall state that unless the student complies with the actions specified, a decision may be taken by the Committee to refuse the student permission to take the examinations or other assessments for the element(s) of the Programme concerned, with the consequence that he or she may be excluded from the Programme.

8. A student who receives due warning in writing that his or her work and attendance is unsatisfactory shall be offered the opportunity to appear in person before the Programme Committee to explain the reasons for non-compliance. A written note of the meeting, stating any modifications to the actions he or she is required to take, shall then be issued to the student.

9. If the student fails to comply with such requirements, the Programme Committee may decide to refuse the student permission to take the relevant examinations or other assessments, with the consequence that he or she will be excluded from the Programme. The Programme Committee shall send notification of decision forthwith to the student’s registered home and study time addresses. A copy of the notification shall also be sent to the Registrar and Secretary.

[Note: In instances where the Programme Committee is satisfied that circumstances exist which show good cause for the student’s failure to comply with the work and attendance requirements, alternative action may be determined, such as interruption from the programme of study for a specified period of time.]

10. No student shall be refused permission to take an examination or other form of assessment on the grounds of unsatisfactory work and attendance unless the warning referred to in paragraph 7 above has been issued.

11. A student who has been refused permission to take an examination or other form of assessment on the grounds of unsatisfactory
work and attendance may submit an appeal against that decision within ten working days of the notification of the decision in accordance with the provisions of Regulation XIX [Academic Appeals].

12. In order to allow sufficient time for completion of the procedure described in paragraph 11 above, the latest date upon which notification of a refusal may be issued is the last teaching day of the second semester prior to the Easter