

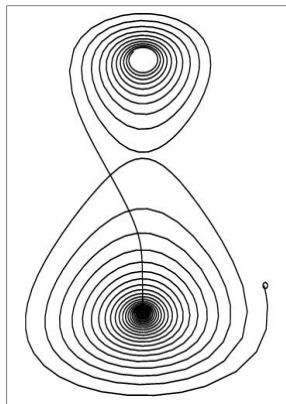


## **MSc/Diplomas in Mathematical Sciences**

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### **Course Guides for the Session 2016 – 2017**

<http://www.macs.hw.ac.uk/students/mathematics/pg-programmes/mscdiploma-course-choices/>



**Department of Mathematics  
School of Mathematical and Computer Sciences  
Heriot-Watt University**

## Contents

<u>1</u> <u>Introduction</u> .....	3
1.1 This Guide.....	3
1.2 Departmental Aims.....	3
1.3 Programme Aims.....	3
1.4 Other Sources of Information.....	3
<u>2</u> <u>General Information</u> .....	3
2.1 Lectures and Tutorials.....	4
2.2 Teaching and Exam Periods.....	4
2.3 Attendance.....	4
2.4 Calculators and Mobile Phones in Examinations.....	4
2.5 Plagiarism.....	5
2.6 Careers Advisory Service.....	5
<u>3</u> <u>Departmental Support Structures</u> .....	5
3.1 Mentors.....	5
3.2 Director of Studies/Course Director – Simon J.A. Malham .....	6
3.3 Staff-Student Committee.....	6
3.4 The Head of Department.....	6
3.5 English Language.....	6
<u>4</u> <u>Communication within the Department</u> .....	6
4.1 Your Responsibilities.....	6
4.2 How We Will Contact You.....	7
<u>5</u> <u>Staff and How to Contact Them</u> .....	7
<u>6</u> <u>Programme Details</u> .....	7
6.1 Common Assessment and Progression System (CAPS).....	7
6.2 Pass and Distinction in the MSc.....	8
6.3 Pass and Distinction in the Diploma.....	8
6.4 Passing the Postgraduate Certificate.....	8
6.5 Transfer Between Diploma and MSc.....	8
6.6 Transfer Between Different Degrees.....	8
6.7 Transfer Between Courses.....	9
6.8 Resitting Exams.....	9
6.9 Programme structures:.....	9
<u>7</u> <u>Rooms, Building Names and course Codes</u> .....	9
Department Name.....	9
<u>8</u> <u>Equal Opportunities and Race Equality Policies</u> .....	10
<u>9</u> <u>Registration to Use the University Computing Facilities</u> .....	11

# 1 Introduction

## 1.1 *This Guide*

These notes have been prepared primarily for the guidance of students in the Department of Mathematics, part of the School of Mathematical and Computer Sciences.

The guide provides an outline of the MSc/Diploma programmes in Mathematical Sciences taught by the Department and gives a summary of University and Departmental regulations. While we try to make this guide as accurate as possible, you should note that the detailed University and Department regulations take precedence over this guide.

## 1.2 *Departmental Aims*

The Department of Mathematics has a very broad mission in the University, comprising undergraduate education for mathematics students, service mathematics education, research and graduate education, and various outreach programmes. Each year, over one thousand students study a course taught by the Mathematics Department.

The goals of the Department of Mathematics are to deliver the highest quality teaching of mathematics to all students who take classes in mathematics, and, through its research, to contribute to the advancement of mathematics and its applications. In the teaching assessment in Scotland we were rated “highly satisfactory” (the second highest rating) while in the UK Research Assessment Exercise we are amongst the best in the UK. We are a part of the [Maxwell Institute for Mathematical Sciences](#), a Joint Research Institute in the [Edinburgh Research Partnership](#) collaboration between Heriot-Watt and Edinburgh Universities.

## 1.3 *Programme Aims*

The general aim is to ensure that our graduates have a sound knowledge of mathematics so that they can successfully pursue careers in industry, commerce, education and scientific research. More specifically our courses aim to enable students to:

- Develop detailed knowledge and critical understanding of central areas in pure mathematics, applied mathematics, computational mathematics and statistics.
- Assimilate and use a range of skills in these mathematical areas.
- Develop original and creative solutions to problems in the mathematical sciences
- Communicate and work effectively with peers and academic staff demonstrating appropriate levels of autonomy and responsibility
- Plan and execute a significant research project, investigation or development in the mathematical sciences demonstrating extensive, detailed and critical understanding of the appropriate area.

## 1.4 *Other Sources of Information*

Further information concerning University regulations and policies is available from the Academic Registry (<http://www.hw.ac.uk/registry/>).

## 2 General Information

### 2.1 Lectures and Tutorials

Classes in mathematics are either lectures or tutorials. A lecture consists mainly of listening, understanding and making notes of the topics being taught. Tutorials will give you an opportunity to ask questions about material which you have not understood, and to find out how to solve problems which you were unable to do on the examples sheets which are given out in lectures.

Classes begin at 9.20 a.m., 10.20 a.m. etc. and are scheduled so that students can change rooms if necessary for the start of the next class.

If you have problems after reading your notes and attempting the tutorial examples, please **ask for help**. You should do this at the classes or by going to see the lecturer teaching the course. To avoid fruitless searches you can make an appointment at the end of a lecture or a tutorial. Lecturers can also be contacted via the secretaries in the School Office EM1.24, or by e-mail (see Section 5).

### 2.2 Teaching and Exam Periods

The full-time Diploma course runs from September to May.

The full-time MSc course runs from September to August.

We teach in 2 semesters. Semester 1 runs from September to December and semester 2 from January to May. Exams are **normally** held at the end of each semester. Roughly there will be 10 weeks teaching, two weeks for revision and two weeks for exams.

For MSc students, the project continues through the summer for submission in August.

Detailed exam timetables are posted on-line of the registry website when they become available.

### 2.3 Attendance

In order to meet the course requirements, a satisfactory record of attendance at lectures and tutorials is required and course work must be handed in by the stipulated dates. Students who, in the opinion of the Head of Department, fail to satisfy these requirements for any of the courses for which they are registered may, after due warning, be disallowed from presenting themselves for examination in those courses. In this case they will be deemed to have failed those courses.

Students with medical and other problems which cause them to miss classes for more than a few days, or which are likely to affect their exam performance should inform their mentor as soon as possible. Self-certification is required for periods of incapacity from work of four days or less, and a doctor's certificate is required for longer periods. Doctor's certificates are **essential** when illness causes absence from examinations.

Self-certification forms should be collected from the School Office EM1.24. Self and Doctor's Certificates should be submitted to the School Office.

## **2.4 Calculators and Mobile Phones in Examinations**

In this time of increasing complexity of computational/communication devices, and in order to ensure that there is a level playing field for all students, only the following types of calculators are allowed in examinations:

Casio fx-85WA, fx-85MS, fx-85ES, fx-85GT Plus, fx-83MS, fx-83ES

Students must supply their own calculators and these may be purchased from the campus shop. See also <http://www.hw.ac.uk/registry/resources/approvedcalculatorguidance.pdf>

Students are not allowed to have mobile phones or other communication devices on their persons or at their desks during examinations. Mobile phones may be left at the front of the examination room but must be left switched off.

## **2.5 Plagiarism**

**Plagiarism is intellectual theft and is a major offence which the University takes seriously in all cases. Students must therefore avoid committing acts of plagiarism by following these guidelines and speaking to academic staff if they are uncertain about what plagiarism means. Those who are found to have plagiarised will be subject to the University's disciplinary procedures, which may result in penalties ranging from the deduction of credits and courses already achieved by students to compulsory termination of studies. Students are advised to refer to Regulation 50 at <http://www.hw.ac.uk/ordinances/regulations.pdf> and to the Guidelines for Staff and Students on Discipline at <http://www.hw.ac.uk/registry/Discipline.php> for further details of how the University deals with all acts of plagiarism.**

We refer you to <http://www.hw.ac.uk/registry/resources/PlagiarismGuide.pdf>

## **2.6 Careers Advisory Service**

The Careers Advisory Service provides high quality careers guidance, education and information services to Heriot-Watt students and graduates. It delivers these through class based group sessions, a dedicated web site <http://www.hw.ac.uk/careers>, a well-equipped information room, drop-in query sessions, and individual appointments.

The service facilitates the employment of Heriot-Watt students and graduates by advertising vacancies, arranging and publicising employer presentations and an annual Careers Fair.

In addition to providing comprehensive information on all aspects of careers, from part-time work to jobseeking in the graduate labour market, they also run practical sessions that include *Producing an Effective CV*, *Preparing for Interview* and *Practice Aptitude Tests*.

There is a Careers Adviser with responsibility for students in Mathematics. You can find the Careers Service on level 1 of the Scott-Russell Building. The Service is open 10:00 – 17:00 Monday to Thursday; Fridays 10:00 – 16:00.

## **3 Departmental Support Structures**

### ***3.1 Mentors***

You will be allocated a mentor when you arrive in the University and, normally, you will retain the same mentor while you are registered in the Department. The mentor/student relationship serves various functions:

If you have personal problems the mentor can often help with a sympathetic chat or by putting you in touch with the appropriate University support service (Medical Centre, Accommodation and Welfare, Students Union or Chaplaincy). The mentor is there to help you - do not hesitate to contact him or her if you need help (see Section 5.) If you have any difficulty contacting your mentor, the secretaries in the School Office EM1.24 will be pleased to arrange an appointment.

### ***3.2 Director of Studies/Course Director – Simon J.A. Malham***

The Director of Studies has the responsibility of ensuring the overall smooth functioning of the course. The Director of Studies will take an overview of all the material taught to the year, should be aware of difficulties which are occurring in any of the courses, will ensure that continuous assessment is carried out in an appropriate manner and will deal with the collation of examination marks.

### ***3.3 Staff-Student Committee***

The Staff-Student Committee is a forum for notification and discussion of various issues affecting our undergraduate and postgraduate taught courses, and provides valuable feedback to the Department. Typical issues raised include organisational problems encountered by students and discussion of proposed changes in course structures. It is composed of two student and one staff representative for each year of the undergraduate and postgraduate mathematics courses. Directors of Studies represent the staff, and the class elects the student representatives. You will be asked to select representatives for this committee early in the first term. The committee meets once each term. Details of the discussion at this Committee are posted on the department's web pages.

### ***3.4 The Head of Department***

We hope that all your problems, both personal and academic, can be resolved with the help of mentors, year Directors of Study and the staff-student committee. If, however, for any reason you find that you cannot resolve a difficulty by these means you should consult the Head of Department.

## 4 Communication within the Department

### 4.1 Your Responsibilities

So that we can communicate easily with you, and so that we can make sure that you are appropriately registered for courses and examinations it is necessary that you:

- (i) Notify the School Office (EM1.24) about any changes in address or telephone number.
- (ii) Notify your mentor of any change of course or elective (in fact s/he must arrange for a form to be completed to authorise such a change).
- (iii) Check your course registration. Around week 3 of each term University Registration will ask you to check that the courses you are studying in that term are those for which you are officially registered - failure to report any errors on the list will lead to a £10 fine by our central administration.
- (iv) Keep your mentor informed about any illnesses or other problems.
- (v) If you choose to redirect your e-mail from your Heriot-Watt address to another provider (e.g. hotmail) then you must notify the Computing Services Help Desk of where to redirect your e-mail, and inform them if that address changes.

### 4.2 How We Will Contact You

To contact you during term time we will probably use e-mail, and will always use your **Heriot-Watt e-mail address**. You can have e-mail to your Heriot-Watt address redirected to another. See Section 9 for details of this and of how to register on the PC Caledonia network. General announcements from lecturers and specific announcements from mentors will be sent to you by e-mail, and you are responsible for keeping up to date with them.

We might sometimes use the **student mailboxes** (for letters) on the first floor of the Earl Mountbatten Building in EM1.25. These mailboxes are also used for mail delivered to students c/o the department. You are expected to check your e-mail and mailbox regularly.

In some circumstances we will also use your **term-time address**. In emergencies we will use e-mail and/or telephone (and any other way we can find) to try to contact you. Outside term time, we will write to your **home address**.

As noted in Section 4.1, it is important to let us know of any changes to your term and/or home addresses as soon as possible. Forms are available outside the School Office EM1.24.

Details of how to contact us by phone, fax, letter and e-mail are given in Section 5.

Please note we will use **vision** <http://vision.hw.ac.uk/> to communicate on the courses and update you on material, sample exams etc.

## 5 Staff and How to Contact Them

Please see the information at <http://www.macs.hw.ac.uk/staff-directory/mathematics.htm>

**Telephone & Fax:** All staff, 0131-451-3432 (0131-451-3249 fax).

**Post:** Department of Mathematics, School of Mathematical and Computer Sciences, Heriot-Watt University, Edinburgh, EH14 4AS.

**In Person:** Staff can be contacted through their offices or via the School Office (EM1.24).

**e-mail:** An easy way to contact most mathematics staff is by e-mail.

**WWW:** A great deal of information about the Department of Mathematics, its staff and postgraduate students can be found at:

<http://www.macs.hw.ac.uk/departments/mathematics.htm>

## 6 Programme Details

### 6.1 Common Assessment and Progression System (CAPS)

The University operates a Common Assessment and Progression System (CAPS) which specifies minimal progression requirements. Schools have the option to apply progression requirements above the minimum University requirements, which are approved by the Studies Committees. Students should refer to the programme specific information on progression requirements. This information is available below. In CAPS your exam result for each course will be presented in the form of a letter grade (A - F) where

Grade	A	B	C	D
Approx. Mark	70%-100%	60%-69%	50%-59%	40%-49%

An 'E' grade will indicate a mark of less than 40% and is awarded when you have done enough to be given credit points in the subject but you have not done enough to be allowed to study the same topic at a higher level. Thus an 'E' should be considered as a rather unsatisfactory pass; an 'F' indicates a fail for which no credit points are given towards your degree.

The final mark for each course will consist of continuous assessment or hand-in work (from 0% to 100% of the total) with a formal exam making up any remainder.

### 6.2 Pass and Distinction in the MSc

Normally, to **pass the MSc** you need:

- 50% average mark on your 8 taught courses
- most courses at grade C or better
- none less than grade D
- dissertation at grade C or better

Normally, to gain a **distinction in the MSc** course you need:

- 70% average mark on your 8 taught courses
- most courses at grade A
- none less than grade C
- dissertation at grade A

### **6.3 Pass and Distinction in the Diploma**

Normally, to **pass the Diploma** course you need:

- 40% average mark on your 8 taught courses
- most courses at grade D or better
- none less than grade E

Normally, to gain a **distinction in the Diploma** course you need:

- 70% average mark on your 8 taught courses
- most courses at grade A
- none less than grade C

### **6.4 Passing the Postgraduate Certificate**

Normally, to **pass the Certificate** course you need:

- 40% average mark on 4 taught courses
- must include at least 2 of the compulsory courses
- most courses at grade D or better
- none less than grade E

### **6.5 Transfer Between Diploma and MSc**

If you are registered for the Diploma course and perform to the standard required for and MSc in the May examinations, then you can ask the Course Director to be transferred to the MSc course. Transfer from MSc to Diploma or Certificate is also possible.

### **6.6 Transfer Between Different Degrees**

The requirements for the different degree courses have a significant overlap. If you have met the requirements for more than one degree course, then there is no problem in transferring between them. Please contact the Course Director to discuss and arrange this. For example, you can choose options to satisfy both of the MScs described in the Course Structure Sections 6.9. If you do this, then you can transfer between them after term 1 or before carrying out the project.

### **6.7 Transfer Between Courses**

If you want to change any of the courses for which you are registered, then see your mentor or the Director of Studies. However, please do this before you miss any of the course you want to switch to, and certainly by week 3 of the semester in which the course is held.

### **6.8 Resitting Exams**

MSc resits are normally held the next time the exam is held. That may be one year later. Resitting should be considered as a last resort. **Students will not normally be allowed to carry out the project part of the MSc if they have not satisfied the requirements on the taught courses outlined in Section 6.1.**

### **6.9 Programme structures:**

Where a course is RECOMMENDED you have been pre-registered for this. You can easily change this by a change of course form from the school office.

A description of the courses please see the web-pages linked from

[http://www.ma.hw.ac.uk/mathscourseinfo/index\\_msc.php](http://www.ma.hw.ac.uk/mathscourseinfo/index_msc.php)

If you wish to take non-standard options this should be discussed and approved by the course director.

## 7 Rooms, Building Names and course Codes

The room codes are given by building name. For example SR214 refers to room 214 in the Scott Russell (Mathematics) building

Department Name	Room code	Building Name
Biological Sciences	JM	John Muir
Building	EC	Edwin Chadwick
Careers and other Admin	SR	Scott-Russell
Chemical Eng.	JC	John Coulson
Chemistry	WP	William Perkin
Civil Engineering	WA	William Arrol
Combined Studies	DB	David Brewster
Computer & Elect Eng.	EM	Earl Mountbatten
Computer Centre	CC	Computer Centre
Languages	HP	Henry Prais
Management	MG	Management
Mathematics	CM	Colin Maclaurin
Mechanical Eng.	NS	James Naysmith
Physics	DB	David Brewster
LT	Lecture Theatre	
ILA	Interpreting Lab A (Henry Prais Building)	
LLA	Language Lab A (Henry Prais Building)	
LLB	Language Lab B (Henry Prais Building)	

### Course codes – 1<sup>st</sup> two characters

Department	Code
Mathematics	F1
Actuarial Mathematics and Statistics	F7
Computer Science	F2
Management	C1
Life Sciences	A1

## 8 Equal Opportunities and Race Equality Policies

The Mathematics department fully supports the principles and practice of equality of opportunity, and endorses the University Equality Policies detailed below.

### Equal Opportunities Policy

Heriot-Watt University is committed to equal opportunities for all, irrespective of sex, colour, ethnic origin, disability, marital status, religious or political beliefs, trade union membership, sexual orientation or other irrelevant distinction.

The University welcomes diversity among staff and students and aims to encourage all individuals to realise their full potential and contribute as fully as possible to the University community. The University aims to create conditions whereby the treatment of students, staff and applicants for employment or study is on the basis of their relative merits, abilities and potential.

The University believes that achievement of equality of opportunity will be in the best interests of the organisation as a whole and its individual members. Consequently, it is committed not only to uphold the letter of the law, but also to promote diversity and equality of opportunity throughout the organisation.

### Race Equality Policy

The University is committed to the elimination of unlawful racial discrimination; and the promotion of equality of opportunity and good relations between persons of different racial groups.

No religious, racial or political test shall be imposed by the University on any person in order to entitle him or her to be admitted as a Member, Professor, Teacher or Student of the University, or to hold office therein, or to graduate thereat, or to hold any advantage of privilege thereof.

*For further information visit: <http://www.hw.ac.uk/personnel/services.htm>*

## 9 Registration to Use the University Computing Facilities

### Self-Registration

You need your student card to complete this process, so do it after you have gone through academic registration.

### E-mail Redirection

If you want to **redirect your e-mail from your Heriot-Watt address to another provider** (e.g. hotmail, gmail) then contact the Computing Services Help Desk. You must keep them informed if that address changes, otherwise you will miss important announcements.

**Help:** If you need help with any of the above, please contact the Computing Services HELP DESK. There is drop-in access or contact via email or telephone: [ithelp@hw.ac.uk](mailto:ithelp@hw.ac.uk) tel. (internal) 4045.

## **Rules**

Students are expected to use the computing facilities in an appropriate and considerate way. Abuse of the facilities is subject to various disciplinary measures, ranging from a ban on access to the facilities to, in extreme and flagrant cases, expulsion from the University. Examples of abuse include monopolising a terminal for non-academic related purposes, running excessively long or inappropriate print jobs, and displaying, circulating or printing offensive material on or from the Internet. Computer games and relay chat are specifically forbidden. Further information on University policy regarding the abuse of computing facilities is available from the Computing Centre.

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