

# MAE111 Engineering Mathematics II

## Course Information: 2011 Semester 1

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### Lectures

**You are expected to attend all lectures. Attendance will be monitored at lectures.**

Time	Slot	Place	
Tuesday 11:00 – 1:00	23 – 24	David Sizer LT	2h lecture with 15 min break
Thursday 2:00 – 3:00	46	FB1.15	1h lecture
Thursday 3:00 – 4:00	47	FB1.15	1h lecture

### Exercise Classes

Time	Slot	Place
Tuesday 2:00 – 3:00	26	GO Jones UG1
Thursday 4:00 – 5:00	48	GO Jones UG1

• Exercise classes start TUESDAY OCT 4 (Week Two).

Exercise classes provide you with somewhere to work and the chance of asking questions to the tutorial assistants who will be available. If you are having difficulty understanding a topic, or answering a problem, then they will try to help you. They are not there to give you full answers to the questions, so don't try asking them!

Each week you should go to just one of these exercise classes. Choose the day that suits you, and move to another day if it gets too crowded. You should turn up if you need some help.

**Attendance at the exercise classes is not compulsory.**

### Coursework (“Homework”)

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- Problem sheets will be handed out every week in the **TUESDAY** lecture (and made available on the course web page).
- Solutions for problems must be handed in by **5:15 pm** on the **TUESDAY of the following week**.
- Coursework **MUST** have your **STUDENT NUMBER** (nine digit number, eg, 010123456) and your **NAME AND INITIALS** clearly marked.
- Join multiple sheets of paper together with a **STAPLE** or a treasury tag, **NOT** a paper clip.
- Coursework is to be handed in by posting into the **YELLOW** MAE111 coursework box on the **GROUND** floor of the **Mathematics Building** (not the Engineering Building). You may also hand in coursework at the end of lectures.
- No work means a score of zero. If you do miss the deadline for a good reason, then follow the instructions given later.
- All of the courseworks count towards your final course mark (unless you are clearly told otherwise). That means that what you hand in must reflect your own attempt at the work. Discussing concepts and questions with colleagues (and tutorial assistants) is always a good way to learn, but in the end the work you hand in must be your own. You should make sure that you read “Examination Offences: Plagiarism in assessed coursework” in the QM Student Guide.

### In-term Tests

There are two in-term tests in weeks 5 and 10 of term. The *provisional* dates for these tests are: October 27, and December 1, at 4.00-5.00. You will be informed later to confirm the dates. See the web page for location and more details. Each test lasts 50 minutes and consists of 6 questions each worth 4 marks. The questions are be similar to, and at the same level of difficulty as the Part A questions of the final May/June exam. Sample Tests are available on the course web site.

## Web Pages

There is a web page for this course: <http://www.maths.qmul.ac.uk/~jrd/MAE111/> which will have:

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- The course information (and any corrections)
- Coursework (available on the same day that it is handed out)
- Lecture notes for the course will on the web, released topic at a time.
- Notes covering “The Basics” i.e. material that is assumed by this course.
- Sample tests, and past exams

## Assessment

Your final course mark comprises: 20% from total coursework mark & 20% from the tests & 60% from the final examination mark. All courseworks count, so you should hand in what ever you have done, even it is very little.

### Excused Coursework

**If you do not hand in a course work, then you will score zero.**

**If, for some good reason, you are unable to hand in ANY work, then this is what you should do:**

- 1.
2. Send an email (to R.Donnison@qmul.ac.uk) to request an *excused* coursework.
3. You **must** include the following details: the full reason for asking for excused coursework, the dates affected, the name of your tutor/adviser. Not providing all these details will mean that I may reject the request.
4. Normally, no more than TWO excused courseworks will be allowed.

### Late Coursework

If you have done some of the coursework but miss the deadline because of circumstances beyond your control, then post the coursework as normal, and send me an email which should give: the full reason for missing the deadline, the dates affected, the name of your tutor/adviser. Not providing all these details will mean that I reject the request. Normally, no more than TWO such late courseworks will be allowed.

## Suggested Text Books

*Note: Lecture notes will be made available, topic by topic, on the course web site as the topic is taught. These lecture notes should be sufficient for revision purposes.*

If you want a text book which collects together a wider range of material than covered in this course, and gives a number of worked examples, then the following books are suggested:

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- **Engineering Mathematics** by STROUD and D.J. Booth (published by Palgrave Macmillan) (any Edition). This is a newly released edition which has just been published. Because there will be many old copies of this or the previous 4th edition (which is also suitable) available, we will provide references to relevant sections of Stroud. Some students prefer Stroud because it contains many worked examples.
- **Mathematics for Engineers**, by Croft & Davison (published by Prentice-Hall)  
Lots of introductory material, and a gentle pace; lots of worked examples; covers most, but not all, material in course

Note: Before you buy a textbook look carefully at it – make sure it has a style that suits your way of learning.

## Key Objectives

1. Differentiation: Basic techniques including chain rule, product rule, logarithmic differentiation, and implicit differentiation.
2. Hyperbolic Functions: Definitions, series, differential coefficients.
3. Series: Convergence and use of ratio test. Maclaurin series and applications to elementary functions. Indeterminate forms.
4. Integration: Basic techniques including integration by parts and by substitution. Simple partial fractions and Simpson’s rule.
5. Applications of Integration: Calculation of plane areas, volumes, centroids and simple moments of inertia.
6. Partial Differentiation: Definition and calculation. Application of  $\delta f = (\partial f / \partial x) \delta x + (\partial f / \partial y) \delta y$  to computation of small changes. Position of stationary points of  $f(x, y)$ .
7. Vectors: Components, addition and subtraction. Scalar and vector products – definition and evaluation in terms

of components.

8. Complex Numbers Cartesian and polar forms. Sums, differences, products and quotients. Argand diagram and simple loci.

(Note: In the formal syllabus, topics 1-3 are included in “Differentiation,” and topics 4-5 in “Integration.”)