University of Dundee

Mathematics Division


Organisation

The MA12003 module runs for 11 teaching weeks in the second semester. All organisation and teaching will be carried out by

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The Module Leader is Dr Wilmot-Smith. You should make an appointment to see Dr Wilmot-Smith if you have a problem regarding the course. You may also bring matters of concern about the course to the attention of the Mathematics Division Staff/Student Committee, which meets once each semester. A volunteer from Level 1 Mathematics will act as class representative to sit on the Staff–Student Committee; their name will be posted on BlackBoard.

Timetable

The weekly timetable for the module consists of five 50 minute classes, typically 3 lectures, 1 workshop and 1 computer laboratory session.

Pre-requisite

In order to take this course you must have at least a C grade pass at Higher Mathematics, or an equivalent qualification.

Note: You may not take this course if you have previously passed or are currently taking AB12007 or MA22003.

Assessment

The overall assessment will be based on your marks for the Coursework and that of a two-hour unseen Degree Examination. The Coursework will consist of 2 class tests, 10 Homeworks and 3 laboratory reports. The assessment weightings are shown in the table below:

<table>
<thead>
<tr>
<th></th>
<th>Weighting</th>
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<tbody>
<tr>
<td>Class Tests</td>
<td>20%</td>
</tr>
<tr>
<td>Homeworks</td>
<td>15%</td>
</tr>
<tr>
<td>Laboratory Reports</td>
<td>15%</td>
</tr>
<tr>
<td>Degree Examination</td>
<td>50%</td>
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</tbody>
</table>

Homework and Laboratory Report deadlines as well as Class Test dates will be posted on MyDundee and announcements made in the class hours.

To pass this module in April/May it is necessary to gain at least 40% in the overall assessment and obtain at least 30% in the Degree Examination and obtain an average of at least 30% in the
Homeworks and obtain an average of at least 30\% in the Class Tests and obtain an average of at least 30\% in the Laboratory Reports.

For those who fail the module in April/May there will be a two-hour resit examination paper at the August Examination diet. To pass this module in August it is necessary to gain at least 40\% in the August Examination.

The Director of Studies may debar a student not performing at a satisfactory level in the continuous assessments from entering the Degree Examination in April/May.

**Syllabus**

**Data Analysis** (1 week)
- Populations and samples; types of data.
- Data presentation.
- Mean; standard deviation.

**Probability** (2 weeks)
- Selection problems.
- Sample space; events; compound events; complements.
- Addition rules.
- Conditional Probability; the multiplication rule; independence.
- Bayes' Theorem.

**Discrete Random Variables** (3 weeks)
- Probability distribution.
- Probability mass functions (Uniform, binomial, geometric, Poisson distributions).
- Joint probability mass functions; covariance and independence.
- Expected value and variance of sums of random variables.

**Continuous Random Variables** (3 weeks)
- Polynomial and negative exponential probability density functions.
- The Normal distribution and tables.
- Expected value and variance of continuous random variables.
- Sums and differences of independent normal random variables.
- The central limit theorem; Normal approximations.
- Random samples.

**Hypothesis Testing** (1 week)
- Hypothesis formulation.
- Test statistics.
- \(p\)-values.
- Confidence intervals.

**Industrial Quality Control** (1 week)
- Control Charts.
- Acceptance Sampling.
Your Commitment

You should attend all classes except on medical grounds or with the special permission of the lecturer concerned. If you are unable to attend the degree examination or complete elements of the coursework on time then you should inform the Module Leader and submit a medical certificate. Medical certificates should be submitted to your School Office (for students advised by Mathematics this is the Office for the School of Engineering, Physics and Mathematics and is in the Fulton Building).

Approved Calculators

The only types of calculators that have been approved for use in assessments in the School of Engineering, Physics and Mathematics are the Casio FX83 and the Casio FX85.

Study Support

If you are having difficulty with the course you are encouraged to seek help at an early stage by making an appointment to see one of the lecturers. You may also obtain additional help from the Maths Base (see BlackBoard for details) or your Personal Tutor.

Feedback

At the end of each section of the module you will be asked to complete a confidential questionnaire regarding the content and presentation of the module. This is an important element in the University’s Academic Standards procedures.

Recommended Books

You will find many introductory statistics books in the library. An example is Introductory Statistics by N.A. Weiss.