University of Dundee  Mathematics Division


Introduction
This course introduces the notions of differentiation and integration for functions of a complex variable. It develops the theory with important applications such as evaluation of integrals via residue calculus, the fundamental theorem of algebra and conformal mappings.

Organisation
The MA32006 module is an introduction to Complex Analysis. This course is worth 15 SCQF credits (7.5 ECTS points). The Module Leader is

Dr Dumitru Trucu,
Room: G7, Fulton Building,
Phone: 01382 384462,
Email: trucu@maths.dundee.ac.uk

Timetable
The course consists of 33 lectures/workshops. The lectures and workshops take place in the Carnelly Small Lecture Theatre.

Syllabus
• Algebraic properties of complex numbers
• Definition of the derivative; Cauchy-Riemann equations.
• Power series; radius of convergence.
• Logarithmic, exponential and trigonometrical functions; branch points.
• Line integrals. The Cauchy integral theorem and integral formula.
• The Cauchy formula for derivatives; Taylor series;
• Liouville’s theorem; fundamental theorem of algebra.
• Laurents theorem; poles and the residue theorem; zeros of analytic functions.
• Evaluation of integrals,
• Conformal mappings

Your Commitment
You should attend all lectures and workshops except on medical grounds or with the special permission of the lecturer concerned.
Study Support
If you are having difficulty with the course work you are encouraged to seek help at an early stage at the Workshops. You may also obtain help from your lecturer or your Personal Tutor.

Assessment
During the semester, there will be three sets of compulsory homework problems (offered at the end of the 4th, 7th, and 9th weeks of lectures) as well as an in-class test (midterm).

The students are required to scan the solutions to each of the three homeworks and submit them via the Blackboard electronic homework submission procedure. Each of these homeworks must be submitted within one week of their release, namely by the end of the 5th, 8th, and 10th week, respectively. These homework problem sets will be graded, and each of them will contribute with 5% towards the final module assessment.

The in-class test will take place in one of the days during the weeks 7 to 9, at a date to be commonly agreed upon. The grade achieved in the in-class test will also contribute with 5% towards the final module assessment.

Finally, the assessment procedure will be completed with a Degree Examination in December 2014.

Therefore, the overall module assessment has the following distribution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Compulsory homework problem set 1</td>
<td>5%</td>
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<tr>
<td>Compulsory homework problem set 2</td>
<td>5%</td>
</tr>
<tr>
<td>Compulsory homework problem set 3</td>
<td>5%</td>
</tr>
<tr>
<td>In-class test (midterm)</td>
<td>5%</td>
</tr>
<tr>
<td>Degree Examination in December 2014</td>
<td>80%</td>
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The Head of Division may debar a student not performing at a satisfactory level in the continuous assessments from entering the Degree Examination.

Feedback
At the end 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.
The course is provided with a complete MA32006 Lecture Notes that will be made available in a PDF on the Blackboard System. The MA32006 Lecture Notes PDF will be updated after each class with the material covered in that particular lecture, and so, by the end of the semester, this will gradually build up in a unitary manuscript containing rigorous proofs and completely discussed examples covering the entire module.

All the theoretical material necessary to prepare for the final examination and the homeworks will be completely covered and fully explained in the MA32006 Lecture Notes.