MATH388
Mathematics III Advanced
S1 Day 2017
Dept of Mathematics

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General Information

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Credit points
3

Prerequisites
Admission to BAdvSc and (MATH232(D) or MATH236(D)) and permission by special approval

Corequisites
MATH335 and MATH337

Co-badged status

Unit description
This unit provides an introduction to a range of topics in mathematics which do not form part of the traditional undergraduate curriculum. It is designed to prepare students to engage with mathematical research literature and areas of current research interest.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes

1. Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
2. Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
3. Apply mathematical principles, concepts, techniques and technology efficiently to solve
practical and abstract problems across a range of areas in the topics covered.

General Assessment Information

This unit is taught concurrently with MATH288. Students in both units are encouraged to attempt all aspects of the course, but their performance will be assessed according to their level of study.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>25%</td>
<td>No</td>
<td>As advised in lectures</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>25%</td>
<td>No</td>
<td>As advised in lectures</td>
</tr>
<tr>
<td>Assessment 3</td>
<td>25%</td>
<td>No</td>
<td>As advised in lectures</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>25%</td>
<td>No</td>
<td>As advised in lectures</td>
</tr>
</tbody>
</table>

Assignment 1

Due: As advised in lectures
Weighting: 25%

Assignment

This Assessment Task relates to the following Learning Outcomes:
- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment 2

Due: As advised in lectures
Weighting: 25%

Assignment

This Assessment Task relates to the following Learning Outcomes:
- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments
incorporating deductive reasoning, in the areas of the topics covered.

- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment 3
Due: As advised in lectures
Weighting: 25%
Assessment

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment 4
Due: As advised in lectures
Weighting: 25%
Assessment

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Delivery and Resources

Classes
Lectures: you should attend each two-hour block in each lecture stream each week, making a total of four hours.

Technology Used and Required
Students are expected to have access to an internet enabled computer with a web browser and
Adobe Reader software. Accounts are available for all students in the Mathematics/Physics computing laboratory (E7B 209) — this will be the location of laboratory sessions and some lectures. Students are expected to work here on assignments and other assessment tasks.

Difficulties with your home computer or internet connection do not constitute a reasonable excuse for lateness of, or failure to submit, assessment tasks.

**Unit Schedule**

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**Policies and Procedures**

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

**Results**

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in *eStudent*. For more information visit ask.mq.edu.au.

**Student Support**

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](http://students.mq.edu.au/support/)

**Learning Skills**

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

**Student Enquiry Service**

For all student enquiries, visit Student Connect at ask.mq.edu.au

**Equity Support**

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

**IT Help**

For help with University computer systems and technology, visit [http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.
Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment tasks

- Assignment 1
- Assessment 2
- Assessment 3
- Assessment 4

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment tasks

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Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

• Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
• Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
• Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment tasks

• Assignment 1
• Assessment 2
• Assessment 3
• Assessment 4

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:
Learning outcomes

• Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
• Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
• Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

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• Assessment 4

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

• Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
• Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
• Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

Assessment tasks

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• Assessment 2
• Assessment 3
• Assessment 4

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be
imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

**Assessment tasks**

- Assignment 1
- Assessment 2
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- Assessment 4

**Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

**Assessment task**

- Assessment 4
Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

**Learning outcome**

- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

**Assessment tasks**

- Assignment 1
- Assessment 2
- Assessment 3
- Assessment 4

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate a well-developed knowledge of the principles, concepts and techniques of the topics covered.
- Construct sustained logical, clearly presented and justified mathematical arguments incorporating deductive reasoning, in the areas of the topics covered.
- Apply mathematical principles, concepts, techniques and technology efficiently to solve practical and abstract problems across a range of areas in the topics covered.

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