MATH700

Research Frontiers in Mathematics

S1 Day 2014

Mathematics

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
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Credit points
4

Prerequisites
Admission to MRes

Corequisites

Co-badged status

Unit description
This unit is designed to engage students with current research in Mathematics. It will introduce students to a number of the current open research questions across the range of the broad discipline. It is the first of a pair of such units, with the second appearing in the second year of the MRes program. This unit addresses research across the breadth of the discipline, while the second unit will focus on more particular issues related to the student's project area. Activities may include such things as seminar attendance, directed reading of research papers, the discussion and critiquing of research topics and introduction to new practical techniques with preparatory reading, hands-on experience and a final report. Presentation of a seminar and a written report based on the topics examined are required for completion of this unit.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Understanding logical arguments and recognising any gaps or faults in such arguments.

Solving problems, including: formulating a precise mathematical question from a "real world" problem; identifying and applying appropriate mathematical techniques.

Expressing yourself clearly and logically in writing.

More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, self-awareness and interpersonal skills, communications, critical analysis, problem solving and creative thinking.
Ethical application of mathematical approaches to solving problems and appropriately reference and acknowledge sources in an mathematical context.

Assessment Tasks

Name	Weighting	Due
Exercises	30%	TBD
Student lecture	30%	Week 13
Report	40%	Week 12

Exercises

Due: **TBD**
Weighting: **30%**

On successful completion you will be able to:

- Understanding logical arguments and recognising any gaps or faults in such arguments.
- Solving problems, including: formulating a precise mathematical question from a "real world" problem; identifying and applying appropriate mathematical techniques.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, self-awareness and interpersonal skills, communications, critical analysis, problem solving and creative thinking.

Student lecture

Due: **Week 13**
Weighting: **30%**

Presentation of a seminar-style lecture at the end of the semester about their directed reading.

On successful completion you will be able to:

- Understanding logical arguments and recognising any gaps or faults in such arguments.
- Solving problems, including: formulating a precise mathematical question from a "real world" problem; identifying and applying appropriate mathematical techniques.
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas:

literacy and numeracy, self-awareness and interpersonal skills, communications, critical analysis, problem solving and creative thinking.

Report

Due: **Week 12**
Weighting: **40%**

Provide a written report, in the form of a short essay, to be submitted in week 13, based on their directed reading.

On successful completion you will be able to:

- Understanding logical arguments and recognising any gaps or faults in such arguments.
- Solving problems, including: formulating a precise mathematical question from a "real world" problem; identifying and applying appropriate mathematical techniques.
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, self-awareness and interpersonal skills, communications, critical analysis, problem solving and creative thinking.

Delivery and Resources

Weekly tutorials. This unit requires access to the internet and university library databases.

Unit Schedule

- Weekly 2 hour tutorial.
- Attend departmental colloquium seminar lectures.

Learning and Teaching Activities

Tutorial

2 hours per week

Seminars

Each student must attend at least 75% of the regular Mathematics Department Colloquia. During the semester we will have lectures concerned with the research interests of the members of the department and their visiting collaborators.

Directed reading

Literature searches and follow up reading on a topic from an area of interest within the Mathematics Department. In the beginning of the semester, the students will use the tutorial time to learn how to use MathSciNet and Math Reviews to track down references to what they have

heard in the colloquia, learn how to search the arXiv web site to keep up with current writing, and work with BiBTeX to learn how to assemble bibliographies from these searches and do citations correctly. The students will do further reading in a topic selected from a short list related to the various research fields within the department. This list will be tailored to each student's interests and prior mathematical education. In the middle part of the semester, the weekly tutorial will provide an opportunity for them to briefly report on their progress and/or difficulties with the reading and gain advice, where needed. In the latter part of the semester, the tutorial will be where they can discuss the drafts of their report and plan and practice their seminar talk. This is to emphasise the benefit of telling someone else about one's work as a technique of refining comprehension.

Prepare presentations

Use the tutorial to prepare both oral and written presentations on the subject of the directed reading.

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:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/

Student Support

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

Learning Skills

Learning Skills (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 Services and 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.

Student Enquiries

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

IT Help

For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

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