



MATH700

Research Frontiers in Mathematics

S1 Day 2018

Dept of Mathematics

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General Information

Unit convenor and teaching staff

convenor

Adam Sikora

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E7A 7.21

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:

Typesetting using Latex and BibTex systems.

Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing

Expressing yourself clearly and logically in writing.

More broadly, you are expected to improve your generic skills in the following areas:

literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>seminar/colloquium attendance</u>	10%	No	ongoing
<u>Assessment</u>	25%	No	TBA
<u>Presentation</u>	25%	No	end of semester
<u>Written report</u>	40%	No	Week 12

seminar/colloquium attendance

Due: **ongoing**

Weighting: **10%**

Satisfactory written record of seminar/colloquium attendance

On successful completion you will be able to:

- Typesetting using Latex and BibTex systems.
- More broadly, you are expected to improve your generic skills in the following areas:
literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment

Due: **TBA**

Weighting: **25%**

Written solutions to some exercises based on lecture material. Some LATEX writing exercises.

On successful completion you will be able to:

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas:

literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Presentation

Due: **end of semester**

Weighting: **25%**

Presentation of a half hour lecture at the end of the semester about directed reading.

On successful completion you will be able to:

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Written report

Due: **Week 12**

Weighting: **40%**

A written report (of roughly 20 pages) based on a directed reading.

On successful completion you will be able to:

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Delivery and Resources

Classes

You should attend the one-hour lecture each week.

Required and recommended texts and/or materials

George Gratzner, More math into LaTeX , 5th ed., Springer, New York, 2016.

John Stillwell, Naive Lie theory , Undergraduate Texts in Mathematics, Springer, New York, 2008.

(available on-line from Macquarie library)

Technology used and required

You are expected to have access to an internet enabled computer with a web browser and pdf viewer. Assignments, beamer files with presentation and written report are to be submitted by email in pdf. There will be a shared DropBox folder from which the course materials -- assignments, and supplementary notes -- will be accessible. Several areas of the university provide wireless access for portable computers. Computers for student use are available in the Library and MUSE. **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

Weekly lecture: Thursday 13:00-14:00.

Learning and Teaching Activities

Lecture

one hour per week

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/p) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/p>

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Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/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/>

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://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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their

professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcome

- Typesetting using Latex and BibTex systems.

Assessment tasks

- seminar/colloquium attendance
- Assessment
- Presentation
- Written report

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment tasks

- seminar/colloquium attendance
- Presentation
- Written report

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment tasks

- seminar/colloquium attendance
- Presentation
- Written report

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment tasks

- seminar/colloquium attendance
- Presentation
- Written report

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically

supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.

Assessment tasks

- seminar/colloquium attendance
- Assessment
- Presentation
- Written report

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Typesetting using Latex and BibTex systems.
- Using MathSciNet and Zbmath.org to track down references, learn how to search the web site arXiv.org to keep up with current writing
- Expressing yourself clearly and logically in writing.
- More broadly, you are expected to improve your generic skills in the following areas: literacy and numeracy, interpersonal skills, critical analysis and communications, critical analysis.

Assessment tasks

- seminar/colloquium attendance
- Assessment
- Written report

Changes since First Published

Date	Description
17/02/2018	Section "Technology used and required" was updated.