



MATH703

Topology

S1 Day 2014

Mathematics

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General Information

Unit convenor and teaching staff

Unit Convenor

Mark Weber

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Credit points

4

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit provides an advanced introduction to the key areas of research interest in modern topology. Topology is the study of continuity. The definition of a topological space was conceived in order to say what it means for a function between such spaces to be continuous. There are several ways of defining topological structure and the proofs that these are equivalent abstract many concrete results about specific kinds of spaces. Different ways of expressing continuity are obtained. Sequences are not adequate for general topological spaces, they need to be replaced by nets or filters, and we discuss convergence of those. Particular properties of topological spaces are analysed in detail: these include separation properties, compactness, connectedness, countability conditions, local properties, metrizable, and so on. Applications to basic calculus are emphasised. We then introduce algebraic topology by discussing the Poincaré or fundamental group of a space.

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.

Assessment Tasks

Name	Weighting	Due
<u>Verbal Quiz</u>	15%	weekly
<u>Assignments</u>	50%	TBA
<u>Final Exam</u>	35%	Examination period

Verbal Quiz

Due: **weekly**

Weighting: **15%**

Informal verbal quiz at the beginning of most lectures, testing students' knowledge of definitions, and related examples and counterexamples, from the previous lectures.

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.

Assignments

Due: **TBA**

Weighting: **50%**

Written solutions, generally involving both proof and calculation.

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.

Final Exam

Due: **Examination period**

Weighting: **35%**

Take-home exam based on the semester's work, to be conducted in department.

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

Classes

You should attend the two-hour lecture each week.

Required and recommended texts and/or materials

There is no required text for this unit. Supplementary notes will be distributed from time to time.

Technology used and required

You are expected to have access to an internet enabled computer with a web browser and pdf viewer. Assignments and the take home exam are to be submitted by email in pdf. There will be a shared DropBox folder from which the course materials -- assignments, exam and supplementary notes -- will be accessible. Several areas of the university provide wireless access for portable computers. There are computers for student use in the Library and in the [Numeracy Centre](#) (C5A 255). **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: Mondays 10am-12pm.

Learning and Teaching Activities

Lecture

2 hours per week

Revision questions

Given out after each lecture

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.