



# MATH702

## Algebra

S1 Day 2014

*Mathematics*

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### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Steve Lack

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Contact via [steve.lack@mq.edu.au](mailto:steve.lack@mq.edu.au)

Credit points

4

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit provides an advanced introduction to key areas of research interest in modern algebra. It will centre around the theory and applications of modules over a ring. Modules are a common generalisation of the notions of vector space over a field, of abelian group, of group representation, and of square matrix. We will see how to extend some of the theory of these notions developed in undergraduate years to the setting of modules. An important recurring idea will be that of a structure theorem, such as the undergraduate-level result that every finitely-generated abelian group is a direct sum of cyclic groups. We shall see various structure theorems for the various algebraic notions studied, with an important example being the Wedderburn theorem for semi-simple rings. Applications to representation theory will be particularly emphasised.

## 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>Quiz</u>	10%	weekly
<u>Assignments</u>	40%	TBA
<u>Final Exam</u>	50%	Examination period

### Quiz

Due: **weekly**

Weighting: **10%**

Brief quiz at the beginning of each lecture, based on the previous week's material.

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: **40%**

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: **50%**

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 Adobe Reader software.

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: Wednesdays 10-12.

## 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](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](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](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/](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](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 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](http://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.