

Subject Information Guide

MATH5735: Modules and Representation Theory

Semester 1, 2014

Administration and contact details

Host Department	Pure
Host Institution	UNSW
Name of lecturer	Dr Daniel Chan
Phone number	(02) 9385 7084
Email Address	danielc@unsw.edu.au
Homepage	Web.maths.unsw.edu.au/~danielch
Name of Honours coordinator	Gary Froyland
Phone number	(02) 9385 7050
Email Address	g.froyland@unsw.edu.au

Subject details

Handbook entry URL

Subject homepage URL

Honours student hand-out URL

Start date:	3/3/2014
End date:	6/6/2014
Contact hours per week:	3

Lecture day and time:

TBA

Description of electronic access arrangements for students (for example, WebCT)

Subject content

1. Subject content description

This subject covers the basic theory of modules over a ring and applies this to the study of representations of finite groups.

2. Week-by-week topic overview

- Examples of rings and algebras.
- Modules and module homomorphisms
- Modules over a principal ideal domain
- Ascending and descending chain conditions
- Semisimple modules and rings
- Wedderburn theory
- Applications of Wedderburn theory to the group algebra
- tensor products
- Character theory
- Radicals

1. Assumed prerequisite knowledge and capabilities

The students is assumed to know the basic theory of groups, rings and fields including the following concepts: homomorphisms, quotient groups/rings, characteristic of a field, Chinese remainder theorem (for rings), dihedral group, Euclidean domains.

2. Learning outcomes and objectives

Consolidate understanding of basic modern algebra through the study of modules and group representation theory and see how the latter in particular provides a way of using symmetry to study phenomena in nature.

AQF specific Program Learning Outcomes and Learning Outcome Descriptors (if available): not available

3. Learning resources

See my webpage for lecture notes and problem sets.

4. Assessment

Exam/assignment/classwork breakdown

Exam	70 %	Assignment	30 %	Class work
-------------	------	-------------------	------	-------------------

Assignment due dates	4/4	16/5
-----------------------------	-----	------

Approximate exam date	20/6
------------------------------	------

Institution Honours program details

Weight of subject in total honours assessment at host department	1/8
---	-----

Thesis/subject split at host department	3:5
--	-----

Honours grade ranges at host department:	0-100
---	-------

H1	85-99 %
-----------	---------

H2a	75-84 %
------------	---------

H2b	65-74 %
------------	---------

H3	50-64 %
-----------	---------