

Subject Information Guide

ANALYSIS – ANALYSIS 701

Semester 1, 2016

Administration and contact details

Host Department	Department of Mathematics
Host Institution	Macquarie University
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Subject details

Handbook entry URL	http://www.handbook.mq.edu.au/2016/Units/ResearchUnit/MATH701
Subject homepage URL	To be advised
Honours student hand-out URL	To be advised
Start date:	29/02/2016
End date:	10/06/2016
Contact hours per week:	2
Lecture day and time:	To be advised
Description of electronic access arrangements for students (for example, WebCT)	To be advised

Subject content

1. Subject content description

This is an advanced analysis course, following closely the first five chapters of the textbook “Real and Complex Analysis” by Walter Rudin:

- 1) Abstract integration
- 2) Positive Borel measures

- 3) L^p spaces
- 4) Banach spaces
- 5) Hilbert spaces

2. Week-by-week topic overview

Weeks 1,2 and 3: Abstract integration: Riemann integration, and the construction and important properties of Lebesgue integration.

Weeks 4 and 5: Construction and properties of Borel measures.

Weeks 6 and 7: Lebesgue L^p spaces and convergence properties.

Weeks 8,9 and 10: Banach spaces and their important properties.

Weeks 11, 12 and 13: Hilbert spaces and their important properties.

3. Assumed prerequisite knowledge and capabilities

A basic course in Real and Functional Analysis (e.g. MATH 339 at Macquarie University which is a first course in Real and Functional Analysis of 4 hours of lectures per week for 13 weeks).

4. Learning outcomes and objectives

1. **Understanding logical arguments and recognising any gaps or faults in such arguments.**
2. **Solving problems, including: formulating a precise mathematical question from a “real world” problem; identifying and applying appropriate mathematical techniques.**
3. **Expressing yourself clearly and logically in writing.**
4. **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.**

5. Learning resources

Walter Rudin’s book “Real and Complex Analysis”.

6. Assessment: There are 5 assignments, worth 20% each. No final exam.

Exam/assignment/classwork breakdown					
Exam	0%	Assignment	100 %	Class work	0 %
Assignment due dates		25/03/2016	8/04/2016	6/05/2016	27/05/2016
Assignment due dates:		10 /06/2016			
Approximate exam date				N/A	

Institution Honours program details

Weight of subject in total honours assessment at host department	12.5% of BPhil
Thesis/subject split at host department	BPhil has no thesis; Thesis is 90% of MRES
Honours grade ranges at host department:	
H1	85
H2a	75
H2b	65
H3	50