Subject Information Guide

Analysis

Semester 2, 2014

Administration and contact details

Host Department	**Department of Mathematics**
Host Institution	**Macquarie University**
Name of lecturer	**Prof Xuan Duong**
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Subject details

Handbook entry URL	**http://www.handbook.mq.edu.au/2014/Units/ResearchUnit/MATH701**
Subject homepage URL	**To be advised**
Honours student hand-out URL	**To be advised**
Start date:	**4/08/2014**
End date:	**14/11/2014**
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 appropriatemathematical techniques.**
3. **Expressing yourself clearly and logically in writing.**
4. **More broadly, you are expected to improve your generic skills in the following ares: 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.**

Exam/assignment/classwork breakdown					
Exam	0%	**Assignment**	100 %	**Class work**	0 %
Assignment due dates		**29/08/2014**	**12/09/2014**	**10/10/2014**	**31/10/2014**
Assignment due dates:		**|14 /11/2014**			
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