

MAST90012 Measure Theory

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours comprising one two-hour lecture per week and one one-hour practical class per week. Total Time Commitment: Not available
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	It is recommended that students have completed a third year subject in metric spaces, measure and integral (equivalent to 620-311 [2008] Metric Spaces and 620-312 [2008] Linear Analysis).
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering requests for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements for this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Prof Greg Hjorth
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Subject Overview:	Measure Theory formalises and generalises the notion of integration. It is fundamental to many areas of mathematics and probability and has applications in other fields such as physics and economics. Students will be introduced to Lebesgue measure and integration. Signed measures. Hahn-Jordan decomposition. Radon-Nikodym derivative. Conditional expectation. Borel sets and standard Borel spaces. Product measures. The Riesz representation theorem. The Krein-Milman theorem. The Stone-Weierstrass theorem. The measure disintegration theorem. Ergodic theory.
Objectives:	After completing this subject, students will: <ul style="list-style-type: none"> # understand the fundamentals of measure theory and have an understanding of how these; # underpin the use of mathematical concepts such as volume, area, and integration; # learn an advanced description of the basic notion of integration; # develop a perspective on the broader impact of measure theory in ergodic theory; and # have the ability to pursue further studies in this and related areas.
Assessment:	Up to 40 pages of written assignments (40%: two assignments worth 20% each, due mid and late in semester), a 3 hour written examination (60%, in the examination period).
Prescribed Texts:	TBA.
Recommended Texts:	TBA.
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees

Generic Skills:	Upon completion of this subject, students should gain the following generic skills: <ul style="list-style-type: none"># the ability to think abstractly;# problem-solving skills including engaging with unfamiliar problems and identifying relevant strategies;# analytical skills including the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of an analysis; and# through interactions with other students, the ability to work in a team.
Related Course(s):	Master of Science (Mathematics and Statistics)