

MAST90012 Measure Theory

Credit Points:	12.50											
Level:	9 (Graduate/Postgraduate)											
Dates & Locations:	This subject is not offered in 2012.											
Time Commitment:	Contact Hours: 36 hours comprising one 2-hour lecture per week and one 1-hour practical class per week. Total Time Commitment: 120 hours											
Prerequisites:	Both of the following subjects, or equivalent:											
	<table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST20022 Group Theory and Linear Algebra</td> <td>Semester 2</td> <td>12.50</td> </tr> <tr> <td>MAST30026 Metric and Hilbert Spaces</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	MAST20022 Group Theory and Linear Algebra	Semester 2	12.50	MAST30026 Metric and Hilbert Spaces	Semester 2	12.50		
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MAST20022 Group Theory and Linear Algebra	Semester 2	12.50										
MAST30026 Metric and Hilbert Spaces	Semester 2	12.50										
Corequisites:	None											
Recommended Background Knowledge:	None											
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/											
Contact:	Prof Arun Ram Email: aram@unimelb.edu.au (https://mce_host/faces/htdocs/aram@unimelb.edu.au)											
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, the Hahn-Jordan decomposition, the Radon-Nikodym derivative, conditional expectation, Borel sets and standard Borel spaces, product measures, and the Riesz representation theorem.											
Objectives:	After completing this subject, students will understand the fundamentals of measure theory and be acquainted with the proofs of the fundamental theorems underlying the theory of integration. They will also have an understanding of how these underpin the use of mathematical concepts such as volume, area, and integration and they will 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:	None											
Recommended Texts:	W. Rudin. Real and Complex Analysis. McGraw – Hill. Third Edition. 1987. P. Halmos. Measure Theory. Springer. 1974.											

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:	<p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include:</p> <ul style="list-style-type: none"> # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; # collaborative skills: the ability to work in a team; # time-management skills: the ability to meet regular deadlines while balancing competing commitments.
Related Course(s):	Master of Science (Mathematics and Statistics)
Related Majors/Minors/Specialisations:	Mathematics and Statistics