MAST90016 Probability for Inference

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 two one-hour lectures per week and one one-hour practical class per weeek. Total Time Commitment: Not available
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	It is recommended that students have completed a subject in probability theory (such as 620-201 [2008] Probability or 620-205 [2008] Probability for Statistics), or their equivalent, and a third year stochastic modelling subject (equivalent to 620-301 [2008] Stochastic Modelling) or its equivalent.
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:	Assoc Prof Aihua Xia
Contact:	Email: aihuaxia@unimelb.edu.au
Subject Overview:	This is an advanced level presenting probability theory from the measure theoretic viewpoint. Topics covered include probability spaces and random variables, the properties of probability measures, Lebesgue decomposition, probability measures on finite dimensional Euclidean spaces, integration and the properties of integrals, the monotone convergence theorem, uniform integrability, the dominated convergence theorem, moments and inequalities, the general notions of absolute continuity and singularity, Radon-Nikodym theorem and conditional expectation given a sigma algebra. The subject will also discuss generating functions (moment, characteristic), modes of convergence and limit theorems with applications to estimation and hypothesis testing. The presented material will be illustrated by applications to Statistics.
Objectives:	After completing this subject students should: # have developed the understanding of the measure theoretic framework of modern probability theory; # acquire technical skills necessary for formulating and solving probabilistic problems, especially in the context of mathematical statistics; and # have developed the probabilistic knowledge base and intuition to pursue further studies in probability, mathematical statistics and stochastic processes.
Assessment:	Up to 40 pages of written assignments (30%: two assignments worth 15% each, due mid and late in semester), a three-hour written examination (70%, in the examination period).
Prescribed Texts:	Shiryayev (1984), Probability, Graduate Texts in Mathematics, Springer-Verlag.
Recommended Texts:	Billingsley (1995), Probability and Measure, Wiley Series in Probability and Mathematical Statistics.

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: # problem-solving skills including engaging with unfamiliar problems and identifying relevant 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 an analysis; and # through interactions with other students, the ability to work in a team.
Related Course(s):	Master of Science (Mathematics and Statistics)