

MAST30020 Probability and Statistical Inference

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Lectures and practice classes.
Time Commitment:	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	One of # 620-295 Real Analysis with Applications (/view/2010/620-295) # 620-158 Accelerated Mathematics 2 (/view/2010/620-158) and one of # 620-201 Probability (/view/2010/620-201) # 620-205 Probability for Statistics (/view/2010/620-205) with a grade of H2B or above
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Prof Konstantin Borovkov
Contact:	Third Year Coordinator Email: tycoord@ms.unimelb.edu.au (mailto:tycoord@ms.unimelb.edu.au)
Subject Overview:	This subject presents a measure-theoretic approach to probability theory, its fundamental concepts and results. It also demonstrates how the theory relates to the key ideas of mathematical statistics, explaining why one is able to make meaningful statistical inference from data and how to apply probability theory to analysing the properties of statistical procedures. Topics covered include: probability spaces and random variables, conditional expectations and sufficient statistics, modes of convergence in probability theory, characteristic functions and key limit theorems, large sample theory and analysis of the maximum likelihood estimators.
Objectives:	On completion of this subject students should: # Have a systematic understanding of modern probability theory; # Have a good knowledge of general conditional expectations, integral transforms and key ideas of different modes of convergence of random variables and distributions; # Be able to interpret and apply fundamental concepts of statistical inference, such as sufficiency and efficiency.
Assessment:	Ten written assignments due at weekly intervals during semester amounting to a total of up to 50 pages (20%), and a 3-hour written examination in the examination period (80%).
Prescribed Texts:	None

Recommended Texts:	A.F. Karr, Probability, 1st Ed. Springer, New York, 1993.
Breadth Options:	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/B-MUS) <p>You should visit learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p>
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.
Notes:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BAsC or a combined BSc course.
Related Course(s):	Bachelor of Science
Related Majors/Minors/Specialisations:	Mathematics and Statistics (Statistics specialisation) Statistics / Stochastic Processes