MAST20004 Probability

Credit Points:	12.5
Level:	2 (Undergraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week, and 1 x one hour computer laboratory class per week Total Time Commitment: Estimated total time commitment of 170 hours
Prerequisites:	One of **Subject** / **Study Period Commencement:** / **Credit Points:** MAST10006 Calculus 2 / Semester 1, Semester 2 / 12.50 MAST10009 Accelerated Mathematics 2 / Semester 2 / 12.50 and one of **Subject** / **Study Period Commencement:** / **Credit Points:** MAST10007 Linear Algebra / Summer Term, Semester 1, Semester 2 / 12.50 MAST10008 Accelerated Mathematics 1 / Semester 1 / 12.50 MAST10013 UMEP Maths for High Achieving Students
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may only gain credit for one of # MAST20004 Probability # MAST20006 Probability for Statistics # MAST30015 Statistics for Mechanical Engineers (prior to 2011) # ELEN30002 Stochastic Signals and Systems (prior to 2011)
Core Participation Requirements:	For the purposes of considering request 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 of 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:	Dr Nathan Ross
Contact:	Second Year Coordinator **Email: sycoord@ms.unimelb.edu.au (mailto:sycoord@ms.unimelb.edu.au)**

Subject Overview:	This subject offers a thorough grounding in the basic concepts of mathematical probability and probabilistic modelling. Topics covered include random experiments and sample spaces, probability axioms and theorems, discrete and continuous random variables/distributions (including measures of location, spread and shape), expectations and generating functions, independence of random variables and measures of dependence (covariance and correlation), methods for deriving the distributions of transformations of random variables or approximations for them (including the central limit theorem). The probability distributions and models discussed in the subject arise frequently in real world applications. These include a number of widely used one- and two-dimensional (particularly the bivariate normal) distributions and also fundamental probability models such as Poisson processes and Markov chains.
Learning Outcomes:	After completing this subject students should: # have a systematic understanding of the basic concepts of probability space, probability distribution, random variable (including the bivariate case) and expectation # be able to use conditional expectations, generating functions and other basic techniques taught in the subject; # be able to interpret a number of important probabilistic models, including simple random processes such as the Poisson process and finite discrete time Markov chains, and appreciate their relevance to real world problems; # be able to formalize simple real-life situations involving uncertainty in the form of standard probabilistic models and to analyse the latter; # develop understanding of the relevance of the probabilistic models from the subject to the important areas of applications such as statistics and actuarial studies.
Assessment:	Four written assignments due at regular 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
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2015/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2015/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2015/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2015/B-MUS)** 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.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	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: # 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. # computer skills: the ability to use mathematical computing packages.
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. Students undertaking Actuarial Studies should take MAST20004 Probability instead of MAST20006 Probability for Statistics.

	Students undertaking this subject will regularly use computers in weekly computer classes, with all the necessary software installed. Students undertaking this subject are not assumed to have any special computer skills at the beginning.
Related Majors/Minors/ Specialisations:	Applied Mathematics Applied Mathematics Discrete Mathematics / Operations Research Discrete Mathematics / Operations Research Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED Statistics / Stochastic Processes Statistics / Stochastic Processes
Related Breadth Track(s):	Accelerated Mathematics Mathematics and Statistics