620-301 Stochastic Modelling

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus. Lectures and practice classes.
Time Commitment:	Contact Hours: 36 one-hour lectures (three per week) and up to 12 one-hour practice classes (one per week) Total Time Commitment: 120 hours total time commitment.
Prerequisites:	*Probability* or a grade of H2B or above in *Probability for Statistics.* Plus at least one of # 620-113 (prior to 2008) # 620-122 (prior to 2008) # 620-123 (prior to 2008) # 620-142 (prior to 2009) # 620-143 (prior to 2009) # 620-192 (prior to 2006) # 620-193 (prior to 2006) # 620-194 (prior to 2006) # 620-211 (prior to 2008).
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Credit cannot be gained for both *Stochastic Modelling* and 300-331 (prior to 2005).
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:	Assoc Prof Aihua Xia
Subject Overview:	This subject introduces the concept of a stochastic process and deals with the important standard stochastic processes, including the Poisson process, Markov chains in discrete and continuous time (with some applications), and renewal processes. Students learn to understand, derive the behaviour and properties, and simulate simple stochastic process models derived from real-life situations. This subject demonstrates the importance of such models and in particular shows their applications to industry and the sciences. Topics covered include review of the main concepts from probability theory, elements of utility theory, basic limit theorems and types of stochastic processes; analysis of Markov chains and their applications (including elements of Markov decision processes); random walks; the Poisson and general jump Markov processes and their applications (with elements of queueing models); renewal theory; and elements of simulation.
Objectives:	.
Assessment:	Up to 50 pages of written assignments due during the semester (20%); 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/2009/D09)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)** 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
Notes:	This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BASc or a combined BSc course.
Related Majors/Minors/ Specialisations:	Mathematics & Statistics Major Mathematics and Statistics (Financial Mathematics specialisation) Mathematics and Statistics (Statistics specialisation)