MAST90059 Stochastic Calculus with Applications

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours comprising 1 two-hour lecture per week and 1 one-hour practice class per week. Total Time Commitment: 3 contact hours and 7 hours private study per week.
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	It is recommended that students have completed a sound undergraduate subject in probability (equivalent to 620-201 Probability or 620-205 Probability for Statistics) and a third year subject in stochastic modelling (equivalent to 620-301 Stochastic Modelling).
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
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Subject Overview:	This subject provides an introduction to stochastic calculus and mathematics of financial derivatives. Stochastic calculus is essentially a theory of integration of a stochastic process with respect to another stochastic process, created for situations where conventional integration will not be possible. Apart from being an interesting and deep mathematical theory, stochastic calculus has been used with great success in numerous application areas, from engineering and control theory to mathematical biology, theory of cognition and financial mathematics.
Objectives:	After completing this subject students should - gain an understanding of the basic knowledge of stochastic calculus; - gain the ability to apply the stochastic calculus to financial derivatives; - extend the probabilistic knowledge base and intuition to pursue further studies in stochastic processes and their applications.
Assessment:	Up to 40 pages of written assignments (20%: two assignments worth 10% each, due mid and late in semester), a 3 hour written examination (80%, in the examination period)
Prescribed Texts:	None
Recommended Texts:	F. Klebaner. “Introduction to stochastic calculus with applications”, 2nd edn. Imperial College Press, London (2005)
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:	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.
Related Course(s):	Master of Science (Mathematics and Statistics)