# MAST90059 Stochastic Calculus with Applications

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| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | This subject is not offered in 2014. |
| **Time Commitment:** | Contact Hours: 36 hours comprising one 2-hour lecture per week and one 1-hour practice class per week. Total Time Commitment: 3 contact hours and 7 hours private study per week. |
| **Prerequisites:** | Both of the following, or equivalent. |

| Subject | Study Period Commencement: | Credit Points: |
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| MAST30001 Stochastic Modelling | Semester 2 | 12.50 |
| MAST30020 Probability and Statistical Inference | Semester 1 | 12.50 |

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| **Corequisites:** | None |
| **Recommended Background Knowledge:** | None |
| **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/ |
| **Contact:** | Email: **aihuaxia@unimelb.edu.au (mailto:aihuaxia@unimelb.edu.au)** |
| **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. |
| **Learning Outcomes:** | After completing this subject students should:<br># gain an understanding of the basic knowledge of stochastic calculus;<br># gain the ability to apply the stochastic calculus to financial derivatives;<br># extend the probabilistic knowledge base and intuition to pursue further studies in stochastic processes and their applications. |
| **Assessment:** | The assessment is based on two assignments worth 10% each and a final 3-hour examination worth 80%. The total amount of written work required for all assignments will not exceed 40 pages. |
| **Prescribed Texts:** | None |
| **Recommended Texts:** | F. Klebaner. Introduction to stochastic calculus with applications, 2nd edn. Imperial College Press, London (2005) |

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| **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:<br># problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies;<br># 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;<br># collaborative skills: the ability to work in a team;<br># time-management skills: the ability to meet regular deadlines while balancing competing commitments. |
| **Related Course(s):** | Doctor of Philosophy - Business and Economics<br>Master of Commerce (Finance)<br>Master of Philosophy - Engineering<br>Master of Science (Mathematics and Statistics)<br>Ph.D.- Engineering |
| **Related Majors/Minors/ Specialisations:** | Mathematics and Statistics |