# MAST90019 Random Processes

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| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | 2012, Parkville<br>This subject commences in the following study period/s:<br>Semester 1, Parkville - Taught on campus.<br>On-campus. |
| **Time Commitment:** | Contact Hours: 36 hours comprising two 1-hour lectures 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:** | Assoc Prof Aihua Xia<br>Email: **aihuaxia@unimelb.edu.au (mailto:aihuaxia@unimelb.edu.au)** |
| **Subject Overview:** | The subject covers the key aspects of the theory of stochastic processes that plays the central role in modern probability and has numerous applications in natural sciences and in industry. It begins with a discussion of ways to construct and specify random processes, then proceeds to distributional convergence of processes, covers the functional central limit theorem and its counterpart for empirical processes, and finally discusses Levy processes and more general continuous time Markov processes. Applications to modelling random phenomena evolving in time are discussed throughout the course. |
| **Objectives:** | After completing this subject students should:<br># gain an understanding of the basic concepts of the theory of stochastic processes;<br># gain an understanding of the fundamental techniques used in the study of random processes;<br># extend their ability to construct mathematical models for real-life situations involving uncertainty and evolving in time;<br># gain the ability to pursue further studies in this and related areas. |
| **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). |

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| **Prescribed Texts:** | None |
| **Recommended Texts:** | TBA |
| **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):** | Master of Science (Mathematics and Statistics) |
| **Related Majors/Minors/ Specialisations:** | Mathematics and Statistics |