MC-SCIMAT Master of Science (Mathematics and Statistics)

Year and Campus:	2012 - Parkville
CRICOS Code:	062189B
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Level:	Graduate/Postgraduate
Duration & Credit Points:	200 credit points taken over 24 months full time. This course is available as full or part time.
Coordinator:	Associate Professor Jan de Ger jdgier@unimelb.edu.au
Contact:	**Melbourne Graduate School of Science** Faculty of Science The University of Melbourne Victoria 3010 Tel: + 61 3 8344 6128 Fax: +61 3 8344 3351 Web: **http://graduate.science.unimelb.edu.au/ (http://graduate.science.unimelb.edu.au/)**
Course Overview:	The Master of Science (Mathematics and Statistics) is a coursework masters degree incorporating a substantial research project. The Master of Science gives students the opportunity to undertake a substantive research project in a field of choice as well as a broad range of coursework subjects including a professional skills component, as a pathway to PhD study or to the workforce.
Objectives:	After completing this course students should have: # discovered the challenge of research in Mathematics and Statistics; # a deeper knowledge of Mathematics and Statistics; # completed a substantial piece of research; and # a sound preparation for future research in Mathematics or Statistics.
Course Structure & Available Subjects:	Students must complete a total of 200 pts comprising: # Discipline subjects (137.5 points); # Professional Skills Subject (12.5 points); # Research Project Component (50 points).
Subject Options:	Students must select a specialisation from one of the following: # Applied Mathematics and Mathematical Physics # Discrete Mathematics and Operations Research # Pure Mathematics # Statistics and Stochastic Processes -

Subjects to be taken from the student's specialisation

Applied Mathematics and Mathematical Physics Specialisation

Students must take two compulsory specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90064 Advanced Methods: Differential Equations	Not offered 2012	12.50

MAST90067 Advanced Methods: Transforms	Semester 1	12.50

Students must select three elective specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90026 Computational Differential Equations	Semester 1	12.50
MAST90066 Continuum Mechanics and Applications	Not offered 2012	12.50
MAST90011 Modelling: Mathematical Biology	Semester 2	12.50
MAST90060 Mathematical Statistical Mechanics	Not offered 2012	12.50
MAST90065 Exactly Solvable Models	Not offered 2012	12.50
MAST90069 Introduction to String Theory	Semester 2	12.50

Discrete Mathematics and Operations Research Specialisation

Students must take two compulsory specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90030 Advanced Discrete Mathematics	Semester 2	12.50
MAST90014 Optimisation for Industry	Semester 1	12.50

Students must select three elective specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90013 Network Optimisation	Not offered 2012	12.50
MAST90050 Scheduling and Optimisation	Semester 2	12.50
MAST90031 Enumerative Combinatorics	Not offered 2012	12.50
MAST90053 Experimental Mathematics	Semester 1	12.50

Pure Mathematics Specialisation

Students must take two compulsory specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90012 Measure Theory	Not offered 2012	12.50
MAST90023 Algebraic Topology	Semester 1	12.50

Students must select three elective specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90025 Commutative and Multilinear Algebra	Semester 1	12.50
MAST90017 Representation Theory	Not offered 2012	12.50
MAST90068 Groups, Categories & Homological Algebra	Semester 2	12.50
MAST90029 Differential Topology and Geometry	Not offered 2012	12.50

MAST90020 Functional Analysis	Semester 2	12.50
MAST90056 Riemann Surfaces and Complex Analysis	Not offered 2012	12.50

Statistics and Stochastic Processes Specialisation

Students must take two compulsory specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90062 Probability & Mathematical Statistics I	Semester 1	12.50
MAST90063 Probability & Mathematical Statistics II	Semester 2	12.50

Students must select three elective specialisation subjects:

Subject	Study Period Commencement:	Credit Points:
MAST90009 Business Forecasting	Not offered 2012	12.50
MAST90051 Mathematics of Risk	Semester 2	12.50
MAST90059 Stochastic Calculus with Applications	Not offered 2012	12.50
MAST90061 Modern Statistical Methods	Not offered 2012	12.50
MAST90019 Random Processes	Semester 1	12.50
MAST90027 The Practice of Statistics	Semester 2	12.50

Further Discipline subjects

Students must also select:

- Two subjects (25 points) from a single specialisation different to the their selected specialisation; and

- **Four subjects (50 points) from any of the specialisations (including up to two approved Masters level subjects from other departments).**

Up to two of these subjects can be replaced with approved undergraduate subjects. Where it is necessary for the student to acquire the required knowledge for Masters level Mathematics & Statistics discipline subjects, up to two further Masters level subjects can be replaced with approved undergraduate subjects.

Professional Skills

Students must take:

Subject	Study Period Commencement:	Credit Points:
MAST90045 Systems Modelling and Simulation	Semester 1	12.50

*Students who have completed the approved equivalent of MAST90045 Systems Modelling and Simulation will be exempt from this subject and will be required to complete an additional 12.5 point Masters-level discipline Mathematics and Statistics subject in its place.

Research Project

A typical course structure for full time students

Full time students are advised to structure their enrolments as follows:

Semester 1 -- 50.0 points of coursework and no research project.
Semester 2 -- 37.5 points of coursework and 12.5 points of research project.

Semester 3 -- 37.5 points of coursework and 12.5 points of research project.
Semester 4 -- 25.0 points of coursework and 25.0 points of research project.

Other structures that are suitable for part time study, or for students who enroll with credit from earlier degrees, can be negotiated with the student's supervisor and the departmental MSc program coordinator.

Research Project Component

The first semester of study is meant for coursework only. During the first semester, students should finalize their choice of research project supervisor and research topic.

The research project starts at the beginning of the second semester of study. Typically, work on the project, including associated thesis and presentation, should be conducted in 60 of the next 66 weeks.

An indicative total time commitment of 800 hours for the duration of the project is expected.

Leave of absence during enrolment in a research project and outside of university holidays requires the approval of the student's supervisor.

Two bound hardcopies of the research thesis are to be submitted two weeks prior to the end of the teaching period in the final semester of research project enrolment, being the forth semester of study. The students will have to give presentations on their research projects in the last week of that teaching period, on a date to be announced by the Department of Mathematics and Statistics at the beginning of that semester.

Under special circumstances, with the permission of the program coordinator, students may be allowed to complete two 25 point research projects in lieu of a single 50 point project.

Subject	Study Period Commencement:	Credit Points:
MAST90042 Research Project	Semester 1, Semester 2	50
MAST90046 Research Project	Semester 1, Semester 2	37.50
MAST90047 Research Project	Semester 1, Semester 2	25
MAST90048 Research Project	Semester 1, Semester 2	12.50

Entry Requirements:

An undergraduate degree with a major in Mathematics and Statistics or Mathematical Physics, with at least an H3 (65%) in the major, or equivalent.

Quotas may be applied and preference may be given to applicants with evidence of appropriate preparation or potential to undertake research. Entry is subject to the capacity of the department to provide adequate supervision in, and resources for, a research project appropriate to the interests and preparation of the individual student and may be subject to the agreement of a member of academic staff to supervise the project module. Selection is not automatic and, in particular, is subject to competition.

Core Participation Requirements:

The Master of Science (Mathematics and Statistics) welcomes applications from students with disabilities. It is University and degree policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the degree. The Master of Science (Mathematics and Statistics) requires all students to enrol in subjects where they will require: (1) the ability to comprehend complex science and technology related information;(2) the ability to clearly and independently communicate a knowledge and application of science, and technology principles and practices during assessment tasks;(3) the ability to actively and safely contribute in clinical, laboratory, and fieldwork/excursion activities. Students must possess behavioural and social attributes that enable them to participate in a complex learning environment. Students are required to take responsibility for their own participation and learning. They also contribute to the learning of other students in collaborative learning environments, demonstrating interpersonal skills and an understanding of the needs of other students. Assessment may include the outcomes of tasks completed in collaboration with other students. There may be additional inherent academic requirements for some subjects, and these requirements are listed within the description of the requirements for each of these subjects. Students who feel their disability will impact on meeting this requirement are encouraged to discuss this matter with the relevant Subject Coordinator and the Disability Liaison Unit: http://www.services.unimelb.edu.au/disability/

Further Study:	The Master of Science offers a pathway to a PhD.
Graduate Attributes:	Graduates will: have the ability to demonstrate advanced independent critical enquiry, analysis and reflection; have a strong sense of intellectual integrity and the ethics of scholarship; have in-depth knowledge of their specialist discipline(s); reach a high level of achievement in writing, research or project activities, problem-solving and communication; be critical and creative thinkers, with an aptitude for continued self-directed learning; be able to examine critically, synthesise and evaluate knowledge across a broad range of disciplines; have a set of flexible and transferable skills for different types of employment; and be able to initiate and implement constructive change in their communities, including professions and workplaces.
Links to further information:	http://graduate.science.unimelb.edu.au