MC-SCIMAT Master of Science (Mathematics and Statistics)

Year and Campus:	2010 - Parkville
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.
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Course Overview:	The Master of Science - Mathematics and Statistics is one of the research training streams of the Master of Science. The research training streams give 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 tools 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:	The Master of Science - Mathematics and Statistics program allows students to focus on a specialist area of the discipline and broaden their experience by taking subjects from other specialisations. Students must complete a total of 200 points over the two year full-time (or four year part-time) program, comprising: Discipline subjects (137.5 points) Students must take 11 of the following subjects: Statistics and Stochastic Processes # 600-655 Business Forecasting # 620-502 Mathematics of Risk # 620-618 Probability for Inference # 620-620 Statistical Inference # 620-624 Stochastic Processes # 620-639 Data Mining # 620-638 Consulting and Applied Statistics Operations Research and Discrete Mathematics # 620-616 Optimisation for Industry # 620-615 Network Optimisation # 620-501 Scheduling and Optimisation # 620-646 Advanced Discrete Mathematics # 620-647 Enumerative Combinatorics # 620-712 Experimental Mathematics Applied Mathematics # 620-637 Computational Differential Equations # 620-617 Phase Transitions and Critical Phenomena # 620-635 Advanced Materials Modelling # 620-629 Integrable Models # 620-644 Mathematical Biology

    # 620-500 Random Walks and Random Structures

    # 620-664 Topics in Dynamical Systems

Pure Mathematics

    # 620-645 Measure theory

    # 620-636 Commutative Algebra

    # 620-619 Representation Theory

    # 620-634 Algebraic Topology

    # 620-630 Algebraic Geometry

    # 620-640 Differential Geometry

    # 620-628 Functional Analysis

    # 620-713 Differential Topology

    # 620-715 Advanced Complex Analysis

    # 620-714 Geometric Group Theory

With the approval of the supervisor and departmental Master program Coordinator, a student will be allowed to substitute up to three of the Discipline Mathematics & Statistics subjects with lower level subjects or subjects from contiguous areas. Of these substitute subjects, up to two can be 200 or 300 level subjects needed to obtain requisite knowledge for Master level Discipline Mathematics & Statistics subjects and up to two can be Master level subjects taught by other Departments of the University.

Professional tools (12.5 points)

Students undertaking the Master of Science (Mathematics and Statistics program) must take the Professional Tools subject 600-617 Systems Modelling and Simulation, unless they have completed 620-131 Scientific Programming and Simulation (2007) or equivalent. If students have previously completed 620-131 Scientific Programming and Simulation (2007) or equivalent, they must take one of the following Professional Tools subjects:

Science Tools

    # 615-505 e-Science

    # 600-618 Ethics and Responsibility in Science

Communication Tools

    # 600-616 Science in Context

    # 600-619 Scientists, Communication and the Workplace

Research Project (50 points)

The Research Project is an integral part of the Master of Science (Mathematics and Statistics program) and a thesis is the main requirement for this component. Students must pass the Research Project to be awarded the Degree.

Students enrolled in the Master of Science (Mathematics and Statistics program) are required to complete a 50 point Research Project. Students may enrol in one or more Research Project subjects as indicated below to ensure they have completed a total of 50 points by the end of their course.

    # 620-649 Research Project - 50 points

    # 620-650 Research Project - 37.5 points

    # 620-651 Research Project - 25.0 points

    # 620-652 Research Project - 12.5 points

Subject Options:	**Statistics and Stochastic Processes**		
	Subject	Study Period Commencement:	Credit Points:
	600-655 Business Forecasting	Not offered 2010	12.50
	MAST90051 Mathematics of Risk	Semester 2	12.50
	MAST90016 Probability for Inference	Semester 1	12.50
	MAST90018 Statistical Inference	Semester 2	12.50
	MAST90019 Stochastic Processes	Semester 2	12.50
	MAST90028 Data Mining	Semester 1	12.50

| MAST90027 Consulting and Applied Statistics | Semester 1 | 12.50 |

Operations Research and Discrete Mathematics

Subject	Study Period Commencement:	Credit Points:
MAST90014 Optimisation for Industry	Semester 1	12.50
620-615 Network Optimisation	Not offered 2010	12.50
MAST90050 Scheduling and Optimisation	Semester 2	12.50
MAST90030 Advanced Discrete Mathematics	Semester 2	12.50
620-647 Enumerative Combinatorics	Not offered 2010	12.50
620-712 Experimental Mathematics	Not offered 2010	12.50

Applied Mathematics

Subject	Study Period Commencement:	Credit Points:
MAST90026 Computational Differential Equations	Semester 1	12.50
MAST90015 Phase Transitions and Critical Phenomena	Semester 1	12.50
MAST90043 Advanced Materials Modelling	Semester 2	12.50
620-629 Integrable Models	Not offered 2010	12.50
620-644 Mathematical Biology	Not offered 2010	12.50
MAST90049 Random Walks & Random Structures	Semester 2	12.50
MAST90052 Topics in Dynamical Systems	March	12.50

Pure Mathematics

Subject	Study Period Commencement:	Credit Points:
MAST90012 Measure Theory	Semester 1	12.50
MAST90025 Commutative Algebra	Semester 1	12.50
MAST90017 Representation Theory	Semester 1	12.50
MAST90023 Algebraic Topology	Semester 1	12.50
620-630 Algebraic Geometry	Not offered 2010	12.50
620-640 Differential Geometry	Not offered 2010	12.50
620-628 Functional Analysis	Not offered 2010	12.50
MAST90054 Differential Topology	Semester 2	12.50
MAST90056 Advanced Complex Analysis	Semester 2	12.50
MAST90055 Geometric Group Theory	Semester 2	12.50

Professional Tools

Subject	Study Period Commencement:	Credit Points:
SCIE90007 E-Science	Semester 2	12.50
SCIE90005 Ethics and Responsibility in Science	Semester 2	12.50

SCIE90004 Science in Context	Semester 2	12.50
SCIE90006 Scientists,Communication & the Workplace	April	12.50

Research 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:	Bachelor degree with a major in an appropriate discipline with at least an H3 (65%) average in the major or equivalent.
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.
Further Study:	The Research Training programs offer 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