# Mathematics and Statistics

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| **Year and Campus:** | 2014 |
| **Coordinator:** | Prof Omar Foda |
| **Contact:** | Email: **omar.foda@unimelb.edu.au (mailto:omar.foda@unimelb.edu.au)** |
| **Overview:** | **Entry Requirements:** Prior studies in Mathematics and Statistics including at least two first year and three second or higher level subjects, with at least an H3 (65%) mark for each of the two best second or higher level subjects. If students have completed accelerated subjects then one fewer subject can be deemed appropriate. |
| **Learning Outcomes:** | The objectives of this diploma are to:<br># further the understanding of Mathematics and Statistics across a wide range of theoretical and practical topics;<br># encourage the development of abilities to think critically and independently;<br># provide a pathway for entry into graduate study in Mathematics and Statistics for students whose main undergraduate field of study was not Mathematics and/or Statistics. |
| **Structure & Available Subjects:** | The Mathematics and Statistics program consists of eight Coursework subjects only (100 points).<br>Subjects are chosen from three sources.<br>1. Advanced Discipline Subjects available to students enrolled into Master of Science (Mathematics and Statistics). The advanced discipline subjects are clustered into four areas:<br># Applied Mathematics & Mathematical Physics<br># Discrete Mathematics and Operations Research Specialisation<br># Pure Mathematics<br># Statistics & Stochastic Processes.<br>2. Students may choose MAST90045 Systems Modelling and Simulation.<br>3. Students may select up to four subjects from latter-year, normally third year, undergraduate Mathematics and Statistics subjects subject to Departmental Program Coordinator approval. |
| **Subject Options:** | **Coursework**<br>Students usually take at least three advanced subjects from a single area.<br>-<br>**Applied Mathematics and Mathematical Physics Specialisation** |

| Subject | Study Period Commencement: | Credit Points: |
|---|---|---|
| MAST90064 Advanced Methods: Differential Equations | Not offered 2014 | 12.50 |
| MAST90067 Advanced Methods: Transforms | Semester 1 | 12.50 |
| MAST90026 Computational Differential Equations | Semester 1 | 12.50 |
| MAST90066 Continuum Mechanics and Applications | Not offered 2014 | 12.50 |
| MAST90011 Modelling: Mathematical Biology | Semester 2 | 12.50 |
| MAST90060 Mathematical Statistical Mechanics | Not offered 2014 | 12.50 |
| MAST90065 Exactly Solvable Models | Not offered 2014 | 12.50 |
| MAST90069 Introduction to String Theory | Semester 2 | 12.50 |

### Discrete Mathematics and Operations Research Specialisation

| Subject | Study Period Commencement: | Credit Points: |
|---|---|---|
| MAST90030 Advanced Discrete Mathematics | Semester 2 | 12.50 |
| MAST90014 Optimisation for Industry | Semester 1 | 12.50 |
| MAST90013 Network Optimisation | Not offered 2014 | 12.50 |
| MAST90050 Scheduling and Optimisation | Semester 2 | 12.50 |
| MAST90031 Enumerative Combinatorics | Not offered 2014 | 12.50 |
| MAST90053 Experimental Mathematics | Semester 1 | 12.50 |

### Pure Mathematics Specialisation

| Subject | Study Period Commencement: | Credit Points: |
|---|---|---|
| MAST90012 Measure Theory | Not offered 2014 | 12.50 |
| MAST90023 Algebraic Topology | Semester 1 | 12.50 |
| MAST90025 Commutative and Multilinear Algebra | Semester 1 | 12.50 |
| MAST90017 Representation Theory | Not offered 2014 | 12.50 |
| MAST90068 Groups, Categories & Homological Algebra | Semester 2 | 12.50 |
| MAST90029 Differential Topology and Geometry | Not offered 2014 | 12.50 |
| MAST90020 Functional Analysis | Semester 2 | 12.50 |
| MAST90056 Riemann Surfaces and Complex Analysis | Not offered 2014 | 12.50 |

### Statistics and Stochastic Processes Specialisation

| Subject | Study Period Commencement: | Credit Points: |
|---|---|---|
| MAST90062 Probability & Mathematical Statistics I | Semester 1 | 12.50 |
| MAST90063 Probability & Mathematical Statistics II | Semester 2 | 12.50 |
| MAST90009 Business Forecasting | Not offered 2014 | 12.50 |
| MAST90051 Mathematics of Risk | Semester 2 | 12.50 |
| MAST90059 Stochastic Calculus with Applications | Not offered 2014 | 12.50 |
| MAST90061 Modern Statistical Methods | Not offered 2014 | 12.50 |
| MAST90019 Random Processes | Semester 1 | 12.50 |
| MAST90027 The Practice of Statistics | Semester 2 | 12.50 |

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Students may choose the following subject:

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

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| **Links to further information:** | http://graduate.science.unimelb.edu.au |
| **Notes:** | This program has a start-year and a mid-year intake. |
| **Related Course(s):** | Postgraduate Diploma in Science |