

## MC-SCIEAR Master of Science (Earth Sciences)

<b>Year and Campus:</b>	2010 - Parkville
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Level:</b>	Graduate/Postgraduate
<b>Duration &amp; Credit Points:</b>	200 credit points taken over 24 months full time. This course is available as full or part time.
<b>Coordinator:</b>	A/Prof Kevin Walsh
<b>Contact:</b>	Melbourne Graduate School of Science Faculty of Science The University of Melbourne  Tel: + 61 3 8344 6404 Fax: +61 3 8344 5803 Web: <a href="http://graduate.science.unimelb.edu.au">http://graduate.science.unimelb.edu.au</a>
<b>Course Overview:</b>	The Master of Science (Earth Sciences) 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.
<b>Objectives:</b>	This course aims to: <ul style="list-style-type: none"> <li># equip students with discipline-specific knowledge and expertise appropriate for post-graduate research in the Earth Sciences field;</li> <li># exercise critical judgement;</li> <li># undertake rigorous and independent thinking;and</li> <li># adopt a problem-solving approach to new and unfamiliar tasks.</li> </ul>
<b>Course Structure &amp; Available Subjects:</b>	<p>The Master of Science (Earth Sciences program) includes collaboration between Earth Sciences/Geosciences departments from at least two other institutions (originally Monash and La Trobe universities, under our Victorian Institute of Earth and Planetary Sciences or 'VIEPS' legal agreement and partnership) expanding in the last decade to involve cooperation between several institutions (including Melbourne). Cooperation at this national level provides students from all participating institutions with the opportunity to access the best and broadest array of advanced coursework in the Earth Sciences discipline.</p> <p>Students must complete 200 points comprising:</p> <ul style="list-style-type: none"> <li># 50 - 62.5 points of the discipline module;</li> <li># 12.5 - 25 points of the Professional Tools module; and</li> <li># 125 points of the Research Project module.</li> </ul> <p>Two streams are offered in the Master of Science (Earth Sciences program): the Atmospheric Science stream and the Geology stream.</p> <p><b>Atmospheric Science stream</b></p> <p>Students with no previous background in Atmospheric Science but who satisfy the mathematics prerequisites for the 3rd-year subjects of the Atmospheric Science major are permitted to substitute one 3rd-year Atmospheric Science subject in place of Current Topics in Atmospheric Science, after first obtaining the permission of the Masters Coordinator.</p> <p><b>Core discipline subjects (50 points)</b></p> <p>Students must take the following subjects:</p> <ul style="list-style-type: none"> <li># 625-662 Mesoscale Atmospheric Dynamics;</li> <li># 625-661 Climate Analysis and Modelling;</li> <li># 625-660 Atmosphere-Ocean Interaction and Climate: and</li> <li># 625-656 Current Topics in Atmospheric Science.</li> </ul> <p><b>Elective discipline subjects (12.5 points)</b></p> <p>Students must choose a further 12.5 points from Master of Science (Earth Sciences program: Geology stream) subjects, Professional Tools subjects or 300-level Science subjects. One elective from another stream within the Master of Science (<a href="http://handbook.unimelb.edu.au/view/2009/R05">http://handbook.unimelb.edu.au/view/2009/R05</a>) or the Master of Environment (<a href="http://handbook.unimelb.edu.au/view/2009/441-MS">http://handbook.unimelb.edu.au/view/2009/441-MS</a>) may also be approved on a case-by-case basis.</p> <p><b>Professional tools (12.5 -25 points)</b></p>

Students must take at least one Professional Tools subjects from the following list:

#### Business Tools

- # 600-614 Business Tools: Money, People and Processes.

#### Science Tools

- # 615-668 Critical Analysis in Science;
- # 615-505 e-Science;
- # 600-617 Systems Modelling and Simulation;
- # 600-618 Ethics and Responsibility in Science;
- # 600-615 Thinking and Reasoning with Data.

#### Communication Tools

- # 600-616 Science in Context,
- # 600-619 Scientists, Communication and the Workplace.

#### Research

##### Research Project (125 points)

Students will gain research experience in Earth Sciences by completing an original research project in their main field of interest. The amount of work completed in this project should be comparable to that undertaken for a published journal article, and students will be encouraged to submit their work for publication. Although the assessment weighting for the literature review may be viewed as low given the word limit, particularly when compared with the final thesis, the former is largely a 'reading topic', from which the student is expected to place their research project into a broader context. In contrast, and as noted above, the final thesis is expected to be a far more rigorous scientific document, showing an appropriate level of insight and scientific interpretation of results, and be of publishable quality. The assessment for the Research Project is therefore:

- # a project-related oral presentation (5%);
- # a literature review (5%, with a word limit of 4,000 words);
- # a thesis (90%, with a word limit of 25,000 words).

Students enrolled in the Master of Science (Earth Sciences program) are required to complete a 125 point Research Project. Subject to supervisor approval, students may enrol in a combination of Research Project subjects as indicated below over their two years of full-time study or over their four years of part-time study, to ensure they have completed a total of 125 points by the end of their course.

- # 625-671 Research Project - 12.5 points
- # 625-672 Research Project - 25.0 points
- # 625-673 Research Project - 37.5 points
- # 625-675 Research Project - 50.0 points

#### Geology stream

##### Core discipline subjects (50 points)

Students must take four of the following, two of which are required to correspond to their thesis topic:

- # 625-653 Geoscience in the Field;
- # 625-654 Hydrogeology and the Environment;
- # 625-652 Geophysics;
- # 625-659 Deposit Models and Mineral Exploration;
- # 625-624 The Geology of Ore Deposits;
- # 625-622 Digital Geoscience;
- # 625-651 Geochemistry and Geochronology;
- # 625-626 Surface Processes and Geodynamics;
- # 625-650 Energy (not offered in 2010);
- # 625-655 Palaeontology and Biogeochemistry (not offered in 2010);
- # 625-627 Structural Geology and Geodynamics;
- # 625-657 Current Topics in Geology A;
- # 625-658 Current Topics in Geology B.

##### Elective discipline subjects (12.5 points)

Students must also take a further 12.5 points of approved coursework subjects, selected either from the above subjects, professional tools subjects, or from 300-level geology subjects.

Electives from another stream within the Master of Science or the Master of Environment may also be approved on a case-by-case basis.

Professional tools (12.5 -25 points)

Students must take at least one Professional Tools subjects from the following list:

Business Tools

- # 600-614 Business Tools: People, Money and Processes.

Science Tools

- # 615-668 Critical Analysis in Science;
- # 615-505 e-Science;
- # 600-617 Systems Modelling and Simulation;
- # 600-618 Ethics and Responsibility in Science;
- # 600-615 Thinking and Reasoning with Data.

Communication Tools

- # 600-616 Science in Context;
- # 600-619 Scientists, Communication and the Workplace.

Research

Research Project (125 points)

Students will gain research experience in Earth Sciences by completing an original research project in their main field of interest. The amount of work completed in this project should be comparable to that undertaken for a published journal article, and students will be encouraged to submit their work for publication. Although the assessment weighting for the literature review may be viewed as low given the word limit, particularly when compared with the final thesis, the former is largely a 'reading topic', from which the student is expected to place their research project into a broader context. In contrast, and as noted above, the final thesis is expected to be a far more rigorous scientific document, showing an appropriate level of insight and scientific interpretation of results, and be of publishable quality. The assessment for the Research Project is therefore:

- # a project-related oral presentation (5%);
- # a literature review (5%, with a word limit of 4,000 words);
- # a thesis (90%, with a word limit of 25,000 words).

Students enrolled in the Master of Science (Earth Sciences program) are required to complete a 125 point Research Project. Subject to supervisor approval, students may enrol in a combination of Research Project subjects as indicated below over their two years of full-time study or over their four years of part-time study, to ensure they have completed a total of 125 points by the end of their course.

- # 625-671 Research Project - 12.5 points
- # 625-672 Research Project - 25.0 points
- # 625-673 Research Project - 37.5 points
- # 625-675 Research Project - 50.0 points

**Subject Options:**

**Discipline core - Atmospheric Science stream**

Subject	Study Period Commencement:	Credit Points:
ATOC90007 Mesoscale Atmospheric Dynamics	Semester 1	12.50
625-661 Climate Analysis and Modelling	Not offered 2010	12.50
625-660 Atmosphere Ocean Interaction and Climate	Not offered 2010	12.50
ATOC90004 Current Topics in Atmospheric Science	March	12.50

**Discipline core - Geology stream**

Subject	Study Period Commencement:	Credit Points:
GEOL90010 Geoscience in the Field	Semester 1	12.50

EVSC90018 Hydrogeology and the Environment	Semester 1	12.50
GEOL90009 Geophysics	Semester 1	12.50
GEOL90014 Deposit Models & Mineral Exploration	March	12.50
GEOL90015 The Geology of Ore Deposits	Semester 1	12.50
GEOL90008 Digital Geoscience	Semester 1	12.50
GEOL90007 Geochemistry and Geochronology	Semester 1	12.50
GEOL90016 Surface Processes and Geodynamics	Semester 1	12.50
625-650 Energy	Not offered 2010	12.50
625-655 Palaeontology and Biogeochemistry	Not offered 2010	12.50
GEOL90017 Structural Geology and Geodynamics	Semester 1	12.50
GEOL90012 Current Topics in Geology A	March	12.50
GEOL90013 Current Topics in Geology B	Semester 2	12.50

### Professional Tools

Subject	Study Period Commencement:	Credit Points:
BUSA90403 Business Tools: Money People & Processes	Semester 2	12.50
615-668 Critical Analysis in Science	Not offered 2010	12.50
SCIE90007 E-Science	Semester 2	12.50
MAST90045 Systems Modelling and Simulation	Semester 1	12.50
SCIE90005 Ethics and Responsibility in Science	Semester 2	12.50
MAST90044 Thinking and Reasoning with Data	Semester 1	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:
ERTH90022 Research Project	March, Summer Term, Semester 2	12.50
ERTH90023 Research Project	March, Summer Term, Semester 2	25
ERTH90024 Research Project	March, Summer Term, Semester 2	37.50
ERTH90025 Research Project	March, Summer Term, Semester 2	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.
<b>Further Study:</b>	The Research Training programs offer a pathway to a PhD.
<b>Graduate Attributes:</b>	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; be able to initiate and implement constructive change in their communities, including professions and workplaces.
<b>Links to further information:</b>	<a href="http://graduate.science.unimelb.edu.au/programs/msc/earthsci">http://graduate.science.unimelb.edu.au/programs/msc/earthsci</a>