The University of Sydney
School of Geosciences

Honours Program 2009

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What Honours is about

The Honours year represents the bridge between (content-driven) undergraduate studies and (research-driven) postgraduate studies. It is an exciting year. For the first time, you have the opportunity to take intellectual leadership of a major research undertaking. It is challenging, but also rewarding. Students who successfully complete an Honours year gain an edge in life, whether that be manifested in employment, further studies, or a desire to better understand the world.

Honours in the School of Geosciences in 2009 will comprise the equivalent of 48 credit points (effectively, two semesters of full time enrollment), with the following requirements:

- 25% from the equivalent of 12 cp of approved coursework units
- 75% Thesis

A list of the Coursework options is provided in a Table at the end of this document.

If you are enrolled full-time and commencing in Sem 1, 2009, your thesis will be due in at 5.00pm on Friday, 30 October 2009. If you wish to enroll part-time, you should consult the Honours coordinator about due dates.

It is possible to commence Honours in the July Semester, however this involves preliminary approval from the Honours coordinator. Note that most Coursework options are not available in the July Semester, meaning that separate and individual arrangements need to be made.

The Honours thesis is a document with a maximum 20,000 word count (exclusive of appendices, bibliography and abstract) divided into chapters. Your are required to submit three hard copies of the thesis, at least one of which must be in full standard (hard cover) binding with the spine suitably embossed and to show the key title of the work, the surname of the student and the degree. The title of the thesis and the name of the student should be on the front cover. Additionally, a pdf version of the thesis also needs to be submitted. Your thesis will be assessed by your advisor and two other independent examiners.

Honours grades

You receive one grade for Honours, at the completion of your 48 credit points. (For full-time students commencing in the February Semester, this is in Nov-Dec.)

H1 (First Class) 80+
H2 (Second Class, First Division) 75-79
H2 (Second Class, Second Division) 70-74
H3 (Third Class) 65-69
No award of Honours less than 65

Elaboration of expectations in each grade is provided in the Box.

Your final Honours grade is based upon work completed during your Honours year, and in the case of University Medals and H1, your WAM.
Honours marking guidelines

95-100
Outstanding First Class quality of clear Medal standard, demonstrating independent thought throughout, a flair for the subject, comprehensive knowledge of the subject area and a level of achievement similar to that expected by first rate academic journals. This mark reflects an exceptional achievement with a high degree of initiative and self-reliance, considerable student input into the direction of the study, and critical evaluation of the established work in the area. Qualities of an outstanding thesis may include:
1. A well chosen issue for investigation with the aims and conclusions being clearly stated within the context of a well-developed and relevant body of literature.
2. Research design and investigation procedures that are appropriate to the problem selected.
3. Some evidence of originality in experimental design.
4. A clear, grammatically correct, concise and coherent thesis that is logical in its structure and has tables, maps, graphs, etc. that are well presented, referenced and accurate. References are correctly cited and, where necessary, detailed data and statistical sources are included in appendices.
5. A high level of understanding of the subject area, including the significance of the work and the limitations of the work.
6. An ability to work with an advisor, but not to rely upon the advisor to generate ideas. In other words, a high level of initiative should be shown.
7. A thesis that is publishable in some form (after abbreviation and minor modifications) in a geographical journal.

90-94
Very high standard of work similar to above but overall performance is borderline for award of a Medal. Lower level of performance in certain categories or areas of study above.

80-89
Clear First Class quality, showing a broad and deep command of the field, with the presentation of some novel insights. Student will have shown a solid foundation of conceptual thought and a breadth of factual knowledge of the discipline, clear familiarity with and ability to use central methodology and experimental practices of the discipline, and clear evidence of some independence of thought in the subject area. Some student input into the direction of the study or development of techniques, and critical discussion of the outcomes.

75-79
Second class honours, first division - student will have shown a command of the theory and practice of the discipline. They will have demonstrated their ability to conduct work at an independent level and complete tasks in a timely manner, and have an adequate understanding of the background factual basis of the subject. Student shows some initiative but is more reliant on other people for ideas and techniques and the project is dependent on supervisor’s suggestions. Student is dedicated to work and capable of undertaking a higher degree.

70-74
Second class honours, second division - student is proficient in the theory and practice of their discipline but has not developed complete independence of thought, practical mastery or clarity of presentation. Student shows adequate but limited understanding of the topic and has largely followed the direction of the supervisor.

65-69
Third class honours - performance indicates that the student has successfully completed the work, but at a standard barely meeting honours criteria. The student’s understanding of the topic is extremely limited and they have shown little or no independence of thought or performance.

0-64
The student's performance in fourth year is not such as to justify the award of honours.
Entry requirements into Honours

Entry into the Honours program will require completion of Units of Study in either the Geography or Geology & Geophysics majors and a Weighted Average Mark (WAM) of at least 65. In some years when the number of applicants exceeds resources (availability of supervisors, laboratory space, etc.) offers will be made according to academic merit. Students are notified in December/January of their formal acceptance into the Honours program.

What you need to do…

1. You should register your interest with the Honours coordinator. (A/Prof Bill Pritchard b.pritchard@usyd.edu.au)

2. You should engage in discussions (as early as possible) with a prospective advisor. She/he will be the person who gives you guidance and academic support throughout the Honours year. It might also be the case that your Honours project is connected in some way to research your advisor is already undertaking. Each student is expected to work closely with his/her advisor during the year. Regular consultation is required. It is not the responsibility of the advisor to chase students for consultation. It is reasonable for students to expect an average of one hour per week consultation with their advisor. Without an approved advisor, you cannot undertake Honours.

3. You should enroll. To enroll, you should fill out the relevant application form (depending on which Faculty you’re enrolled in).


Arts: Obtain an application form from the Faculty of Arts Office, located in the Western Tower end of the Main Quadrangle.


Other students (ask your Faculty)

The formal UoS codes for Honours are:

Geography GEOG 4011 GEOG 4012 GEOG 4013 GEOG 4014
Geology GEOL 4011 GEOL 4012 GEOL 4013 GEOL 4014
Geophysics GEOP 4011 GEOP 4012 GEOP 4013 GEOP 4014

Note: these are administrative codes that don’t really bear any significance on the thesis and coursework requirements you actually undertake.
Coursework options

As specified earlier, the Honours requirements in the School of Geosciences oblige students to select the equivalent of 12 credit points of the coursework options listed in the table below. Note that these are ‘in-house’ units of study. Once you decide upon your options (in early 2009), you must email your decision to the Honours coordinator who will confirm acceptance via email.

Additional to the coursework options, completion of the Honours year requires the following participation:

- Attendance at 2 two-hour seminars in Week 1 of the February Semester that introduces the Honours year and the academic requirements pertaining to writing a thesis. This is **compulsory** for all students in the Honours programs of the School of Geosciences (i.e., Geography, Geology and Geophysics). Details of the time and place of these seminars will be provided early in 2009.
- Participation in workshops and seminars as specified by the Honours coordinator, Deputy Coordinator or your advisor.
- Presentation of your thesis results at a School of Geosciences conference, held in the first week of November (the week after Honours theses are submitted). This presentation will constitute 5% of the grade you receive for your thesis.

Inability to participate in any of these activities without explanation (i.e., explicit agreement from the Honours coordinator and/or special consideration) constitutes grounds for penalty in the allocation of final marks. The table below provides an indicative list of options for 2009.

<table>
<thead>
<tr>
<th>In-house code</th>
<th>Credit point equivalent</th>
<th>Title</th>
<th>Coordinator</th>
<th>Summary details</th>
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</thead>
</table>
| HONS-1        | 6 cp                     | Thinking Geographically: Epistemology, Theory and Practice in the Discipline of Geography (Note: this option is compulsory for students enrolled in Geography Honours) | A/Prof Bill Pritchard | Geography is an inter-disciplinary field, not always well understood by outsiders. The aim of this unit is to introduce students to key frameworks used in the field of Geography. This includes a history of the discipline, the politics of ‘what it means’ to be a geographer; and the discipline’s contribution to broader research and understanding in the social and natural sciences.  
- 2hr lecture/seminar from weeks 2-7;  
- One-day progress-report workshop in August;  
- One-day final conference in November;  
- Preparation of a poster for public display in Madsen Building;  
- Weekly reading tasks as directed.  
- Assessment: Exam (week 8) 60%; Poster 40% |
<p>| HONS-2        | 6 cp                     | Research Methods and Ethics in Human Geography                        | A/Prof Bill Pritchard | To undertake Human Geography research involves an understanding of key methodological issues and related ethical considerations. In Australian Universities, research that involves human interactions requires prior approval from a legally constituted Human Research Ethics Committee (HREC). Thus unit of study introduces students to these issues and involves preparation of a HREC protocol. |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Course Description</th>
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</table>
| HONS-3     | 3 cp    | Introduction to Weathering (SUGOGG elective 25)                                | Dr Derek Wyman                    | The aim of this course is to provide an introduction to the Regolith weathering profile in an Australian context. Weathering mechanisms and processes will be related to the tectonic and paleoclimatic history of Australia and its landscapes. Ore deposits in the regolith and the role of the regolith in the development of ore deposits will also be examined. The course will:  
  - Provide a basic knowledge of Regolith models, terminology, and classification schemes used in Australia  
  - Establish the role of protolith, climate, tectonics,(etc) on regolith development  
  - Characterise the behaviour of major and trace elements during weathering  
  - Illustrate concepts and techniques applied to ore deposit exploration in weathered terranes  
This is a four-day course which includes 16 lecture hours and 9 practical hours. Assessment: Students are evaluated by written examination (60%) and on practicals and a short written assignment. |
| HONS-4     | 6 cp    | Advanced Field Course in Structural Geology and Tectonics: Characterisation and Interpretation of Regional Finite Strain Fields (SUGOGG elective 2) | Dr Patrice Rey                    | This field course aims to introduce experienced field geologists, apprentice structural geologists, and geophysicists to the modern approach of large-scale tectonic systems. On the basis of continuum mechanics, participants will learn to document and characterise regional finite strain fields, and to interpret them in terms of progressive deformations, finite strain fields superimposition, incremental strain fields interference, or mechanical instabilities. Expected outcomes:  
  1. To be able to construct tectonic maps,  
  2. To be able to separate from the total regional finite strain field the component related to local mechanical heterogeneities  
  3. To be able to interpret regional finite strain field in terms of large scale tectonic systems.  
The program has theoretical (20%), and field (80%) components. Lectures:  
  - Introduction to modern structural geology and tectonics.  
  - Finite and Incremental Strain: Relevance for Regional-Scale Structures.  
  - Finite Strain Fields Superimposition vs Incremental Strain Fields Interference.  
  - Geodynamics of Mountain Belts and Large-Scale Structures in Orogens.  
  - Finite Strain Field of Large-Scale Tectonics Systems.  
  - Field mapping exercise: Characterisation of Regional Finite Strain Field in an High Grade metamorphic terrains.  
Lectures will be delivered late June and field component will be delivered during the second week of July at the Pumbago Station in the Olary-Broken Hill Proterozoic block. It will be run in conjunction with but separately from GEOS3008/GEOS307 the USYD/Macquarie 3rd Field course. |
| HONS-5 | 6 cp | Geochemical Analysis Techniques and Applications (SUGOGG elective 12) | Dr N.J. Pearson and Dr S.E. Jackson (Macquarie University) | This is an introduction to the various analytical techniques used in inorganic geochemistry to determine the major element, trace element and isotopic composition of rocks and their constituent minerals. The objectives of this module are:  
- to familiarise students with the various analytical techniques used in geochemical analysis, concentrating on the facilities available in the Geochemical Analysis Unit (X-Ray fluorescence spectrometry (XRF), electron microprobe analysis (EMP), inductively coupled plasma mass spectrometry (ICP-MS), including quadrupole and multi-collector instruments, and solution and laser ablation sample introduction.  
- to develop a basic working knowledge of the principles and procedures used in the evaluation and manipulation of geochemical data.  
- to demonstrate the importance of data quality in the application of geochemical data to solve petrological problems.  
The unit is run in a short-course format over 5 days (30 hours), with 3 on-campus sessions. The form of the unit is to provide theory in the lectures and then to extend this into practical applications during the tutorials and practicals. The class will be divided into groups to undertake the practical sessions on the XRF, ICPMS and electron microprobe. Although basic instruction will be given in instrument operation the main aim in the practicals is for you as a group to develop an analytical strategy to solve the problems presented to you. Attendance at lectures/practical/tutorial sessions is compulsory. |
| HONS-6 | 6 cp | Numerical Modelling of Geodynamic Processes (SUGOGG elective 22) | Dr. Patrice Rey and A/Prof Dietmar Mueller | Through Tectonic and Geodynamic processes the Earth has evolved into a self-organized complex system of endogenic and exogenic envelopes exchanging energy and matter. Without these processes the Earth would be a dead chondritic planet frozen in time. Recent advances in numerical methods, numerical codes, and high performance parallel computing provide geoscientists with the ability to model these processes; a task that was until recently reserved to a few computational laboratory in the world. Numerical Simulation of Lithospheric Processes is a 5-day postgraduate course dedicated to an audience of geoscientists keen to develop a practical expertise in numerical modelling. The course will develop the following topics:  
- Principles of Geodynamics - Heat Transfer and Continental Geotherm  
- Deformation of Earth Materials and Rheology of the Continental Lithosphere  
- Design of Model in Ellipsis - Writing template and using Ellipsis GUI  
- Ground Truthing of Models through Inversion of Geological Observables  
- Image Processing for Ellipsis graphic outputs  
- Modelling Continental extension, contraction and gravity driven processes  
- Modelling Mantle Processes. |
| HONS-7 | 3 cp | Data Processing & Plotting using Generic Mapping Tools (GMT) SUGOGG elective 23 | A/Prof Dietmar Mueller, Dr Maria Sdrolias | This course aims to introduce students to the Generic Mapping Tools (GMT) computer programs set in conjunction with UNIX general processing tools (awk, grep) and basic shell programming. The GMT system is a public domain (i.e. free) software package that can be used to process and plot scientific data (2-D time-series or (x,y) series or 3-D data sets |
((x,y,z) grids). The course is designed for new users to GMT with an interest in developing skills in data processing and data visualization/map-making. The course will run over 4 days from 9 am to 4 pm. The course will consist of 6 lectures and practical exercises in a Linux computer lab.

<table>
<thead>
<tr>
<th>Code</th>
<th>CP</th>
<th>Description</th>
<th>Instructors</th>
<th>Description</th>
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<tbody>
<tr>
<td>HONS-8</td>
<td>3</td>
<td>Fluvio-coastal flows &amp; sediment dynamics</td>
<td>Dr Peter Cowell, Dr Melissa Neave, Dr Ana Villa-Concejo</td>
<td>An awareness of principles in fluid dynamics and sedimentation processes is fundamental to an understanding and analysis of geomorphology of coasts and rivers. The course introduces advanced principles that apply to both these geomorphic environments, but also addresses some key process differences. The course covers both theory and distinctive practical methods, such as wave refraction computations on coasts, analysis of hydrographs and discharge in rivers, and computation of sediment transport estimates in both. The course will run over 4 days from 10 am to 5 pm, with a roughly equal mix of lectures and laboratory exercises.</td>
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<tr>
<td>HONS-9</td>
<td>3</td>
<td>Topographic measurement</td>
<td>Dr Peter Cowell, Dr Melissa Neave, Dr Ana Villa-Concejo</td>
<td>This course provides intensive instruction and hands-on use of topographic survey methods using survey equipment ranging from the most robust and rudimentary devices to advanced state of the art instruments (RTKGPS) available for hydrographic and terrestrial measurement of terrain of relevance to geographers and geologists. The course also covers the formal practical necessities of geo-referencing survey data, data reduction, data plotting, and GIS data integration. The course runs over 4 days from 10 am to 5 pm, and consists entirely of practical demonstration and applications.</td>
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<tr>
<td>HONS-10</td>
<td></td>
<td>Honours special project A</td>
<td>Various</td>
<td>An industry placement of other approved variant. Explicit approval required from Honours Coordinator.</td>
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<tr>
<td>HONS-11</td>
<td></td>
<td>Honours special project B</td>
<td>Various</td>
<td>An industry placement of other approved variant. Explicit approval required from Honours Coordinator.</td>
</tr>
<tr>
<td>HONS-12</td>
<td>3 or 6</td>
<td>Enrollment in a senior unit of study</td>
<td>Various</td>
<td>Subject to approval from the Honours coordinator, students can use their participation in a senior unit of study (that has not already been taken as part of an undergraduate degree) as one coursework option.</td>
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</table>