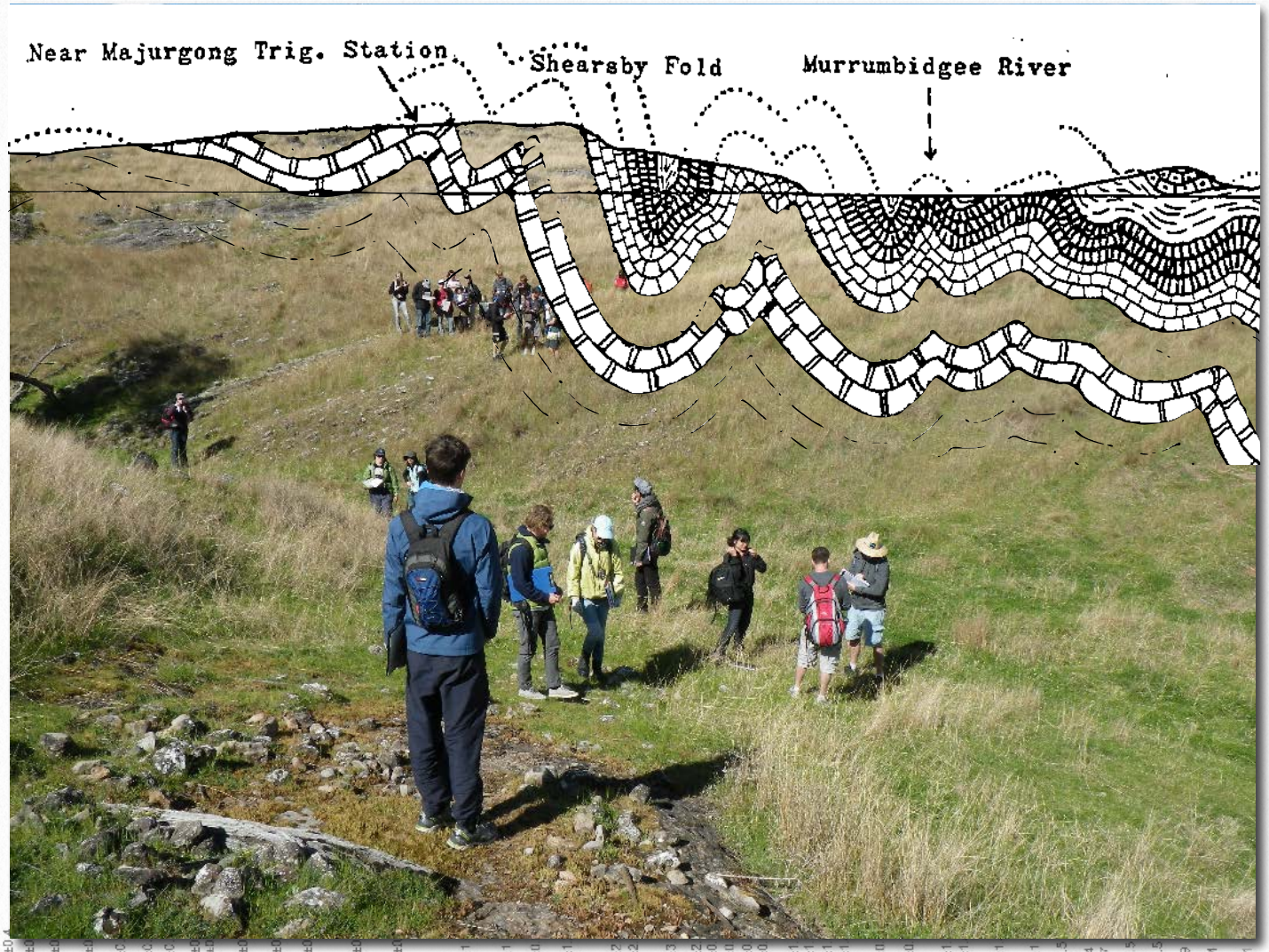
THE UNIVERSITY OF SYDNEY

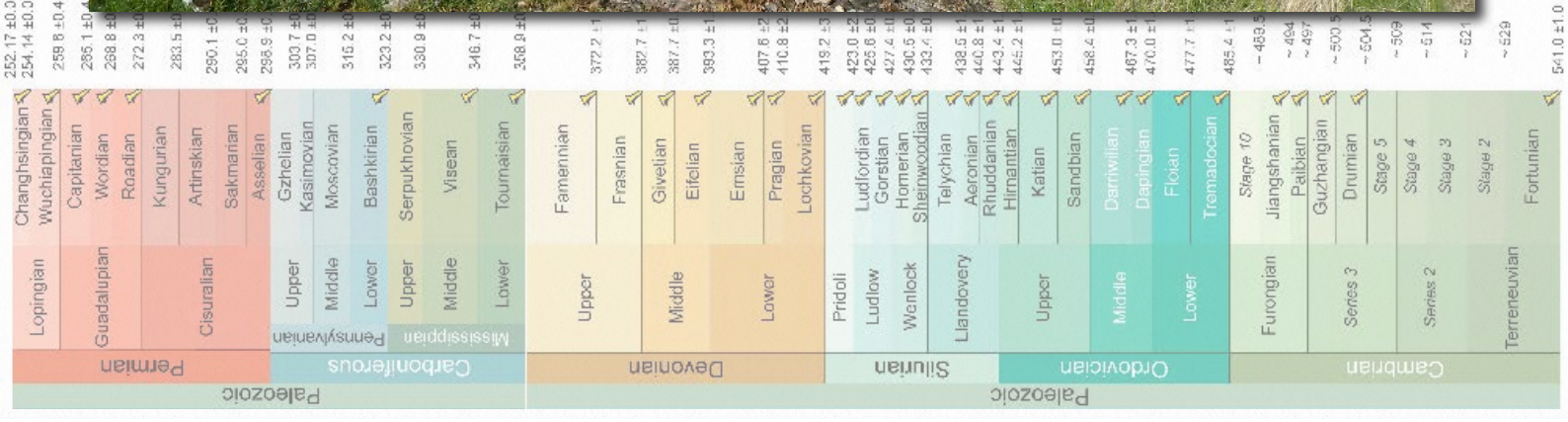
School of Geosciences

Patrice F. Rey (coordinator)
Adriana Dutkiewicz

GEOS-2124/2924

FOSSILS & TECTONICS





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GEOS-2124/2924 Fossils and Tectonics

Synopsis- Following first semester GEOS2114 on deep crustal processes, this 6-credit point Unit of Study (UoS) focusses on how fossils, stratigraphic and structural data are combined to determine ages, environments of deposition and tectonic evolution of sedimentary rocks formations and sedimentary basins. GEOS2114 and GEOS2124 provide the foundation for further development into senior geology and geophysics. In its first module, GEOS21(9)24 covers an introduction to historical geology and the evolution of the major fossils groups. You will gain familiarity with the most important fossil groups, how to identify them and the environmental information they provide. You will learn the methods of stratigraphic age determination including litho-, bio-, chemo-, and magneto-stratigraphy, as well as radiometric geochronology and the stratigraphic characteristics of the main geological time intervals. In the second module, you will learn the methods of structural geology used to document, characterize and interpret the deformation of sedimentary rocks formations. During a week-long field mapping excursion (near Yass), you will develop geological mapping skills by combining your new understanding of structural geology and biostratigraphy. The formation of fossil fuels such as coal, oil and gas is covered by the third module in an earth history and resource exploration context. GEOS2124 will sharpen your observation skills and 3D geological thinking. You will learn to link and combine multi-dimensional geological observations into a coherent and robust geological model, and to use this model to make testable prediction. Fieldwork is a great opportunity to strengthen your teamwork skills.

GEOS-2924- With the same objectives as GEOS2124, this UoS is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students will participate in alternatives to some aspects of GEOS2124 and will be required to pursue independent work. This unit may be taken as part of the BSc (Advanced).

Prerequisites: 24 credit points of junior Units of Study, including GEOS1003 or GEOS 1903 or GEOL1501.

Learning Outcomes - Following completion of this unit, and provided that you diligently attend all classes, invest the advised 12 hours to work per week, and complete successfully all assignments, you will be able to:

1/ understand and apply concepts relating to stratigraphy and geological times;

2/ recognize major fossil groups and understand their evolution through geological times;

3/ document, characterize and map structures accommodating deformation of sedimentary rocks, and sedimentary rock formations;

4/ construct accurate cross-sections across fold systems, perform paleostress analysis, perform 3D geometrical analysis of structural data using stereographic projection and stereonet canvas;

5/ undertake geological mapping and enquiries in sedimentary basins, combining stratigraphy, analysis of fossil records and structural geology;

6/ in the field, source and analyse information, assess its reliability and significance;

7/ understand the transformation of organic matter into fossil fuel such as hydrocarbon and coal;

8/ communicate scientific information appropriately, both orally and through written work;

9/ engage in teamwork for scientific investigations and for the process of learning;

10/ develop a sense of responsibility, ethical behaviour and independence as a learner and as a scientist.

Graduate Attributes

Graduate attributes are the generic attributes that encompass not only technical knowledge but additional qualities that equip students to be strong contributing members of professional and social communities in their future careers. The overarching graduate attributes identified by the University relate to a graduate's attitude or stance towards knowledge, towards the world, and towards themselves. These are understood as a combination of five overlapping skills or abilities, the foundations of which are developed as part of specific disciplinary study (http://www.itl.usyd.edu.au/graduateattributes/).

GEOS2124-2924 contributes toward the graduate attributes listed in the following table:

Graduate Attributes		Week
A Research and Inquiry		
A1	Apply scientific knowledge and critical thinking to identify, define and analyse problems, create solutions, innovate & improve current practices.	1 to 13
A2	Gather, evaluate and deploy information relevant to a scientific problem.	1 to 13
A3	Design and conduct investigations, or the equivalent, and analyse and interpret the resulting data.	7 to 9
A4	Critically examine the robustness and validity in scientific argument and discourse, and evaluate the relative importance of ideas.	1 to 6
A5	Disseminate new knowledge and engage in debate around scientific issues	Yass
A6	Value the importance of continual growth in knowledge and skills, and recognize the rapid and sometimes major changes in scientific knowledge and technology.	1 to 13
B Information Literacy		
B1	Use searching tools (such as catalogues & databases) effectively & efficiently to find information.	1 to 6
B2	Access a range of information sources in the science disciplines, for example books, reports, articles, patents and company standards.	1 to 6
B3	Critically evaluate the reliability and relevance of information in a scientific context.	1 to 6, Yass
B4	Consider the economic, legal, social, ethical & cultural issues in the gathering and use of information.	12, 13
B5	Use information technology to gather, process, and disseminate scientific information.	1 to 7
C Communication		
C1	Explain and present ideas to different groups of people in plain English.	Yass
C2	Write & speak effectively in a range of contexts and for a variety of different audiences and purposes.	Yass
C4	Present and interpret data or other scientific information using graphs, tables, figures and symbols.	1 to 13
C5	Work as a member of a team, and take individual responsibility within the group for developing and achieving group goals.	Yass
C6	Take a leadership role in successfully influencing the activities of a group towards a common goal.	Yass
C7	Actively seek, identify, and collaborate with others in a professional and social context.	Yass
D Ethical, Social and Professional Understanding		
D1	Demonstrate an understanding of the significance and scope of ethical principles, both as a professional scientist and in the broader social context, and a commitment to apply these principles when making decisions.	Yass
D2	Appreciate the importance of sustainability and the impact of science within the broader economic, environmental and socio-cultural context.	12,13
E Personal and Intellectual Autonomy		
E1	Evaluate personal performance and development, recognise gaps in knowledge and acquire new knowledge independently.	1 to 13
E2	Demonstrate flexibility in adapting to new situations and dealing with uncertainty.	Yass
E3	Reflect on personal experiences, & consider their effect on personal actions & professional practice.	Yass
E4	Set achievable and realistic goals and monitor and evaluate progress towards these goals.	1 to 13
E5	Demonstrate openness and curiosity when applying scientific understanding in a wider context.	1 to 13

Grades criteria and learning outcomes: In the context of GEOS21(9)24 the grades are aligned with learning outcomes. These criteria help you understand what is expected from you in order to achieve a given grade.

Criteria	***Pass***	***Credit***	***Distinction***	***High Distinction***
Stratigraphy and stratigraphic methods	Demonstrate a satisfactory understanding of underlying principles and methods used in stratigraphy, lithostratigraphy, biostratigraphy and magnetostratigraphy. Understand how environments shift through time and how to correlate stratigraphic units. Understand how to use fossil range charts and how to use polarity reversals in the dating and correlation of rock units.	As for Pass but in addition demonstrate a good understanding of the subject area. Be able to apply these principles/methods to establish a comprehensive sequence of geological events.	As for Credit but in addition demonstrate high-level aptitude for the subject area. Be able to apply and combine these principles/methods to establish a sequence of events in a geologically complex area.	As for Distinction but in addition demonstrating a flair for the subject area. A comprehensive understanding of the material should be apparent, and clear critical evaluation of the applicability of the various methods to a stratigraphically and structurally complex region where the geological section shows multiple discontinuities.
Geochronology	Know the main subdivisions of the geological time scale and how the timescale was developed. Understand the relationship between chronostratigraphy and geochronology. Understand how some of the key dating techniques work.	As for Pass but in addition demonstrate a good understanding of the subject area. Be able to apply a suitable geochronological method to the geological material in question.	As for Credit but in addition demonstrate high-level aptitude for the subject area. Be able to apply and combine relative and absolute dating methods to a geologically complex area and understand the potential errors intrinsic to each method.	As for Distinction but in addition demonstrating a flair for the subject area. A comprehensive understanding of the material should be apparent, and clear critical evaluation of the applicability of the various geochronological methods demonstrating an ability to calculate and assess ages using a variety of key techniques.
Fossils	Be able to recognise different modes of preservation of fossils. Be able to distinguish and classify key invertebrate fossil groups based on their morphology. Be familiar with age ranges of major fossil groups.	As for Pass but in addition demonstrate a good understanding of the subject area. Demonstrate an understanding of the mode of life of major fossil groups and their usefulness in biostratigraphy.	As for Credit but in addition demonstrate high-level aptitude for the subject area. Be able to identify multiple key morphological features and their function in major fossil groups.	As for Distinction but in addition demonstrating a flair for the subject area. A comprehensive understanding of the material should be apparent, and clear critical evaluation of the importance of major fossil groups as palaeoenvironmental indicators and their evolution through time.
Archean & Proterozoic and Palaeozoic eons	Be able to distinguish geological eons based on their unique environmental, stratigraphic and palaeontological records.	As for Pass but in addition demonstrate a good understanding of the subject area. In particular, show a sound understanding of the major environmental and evolutionary changes through Earth's history.	As for Credit but in addition demonstrate high-level aptitude for the subject area. Be able to evoke multiple lines of evidence used to support major events in Earth history such as the Great Oxidation Event, glaciations, rise of multi-cellular organisms.	As for Distinction but in addition demonstrating a flair for the subject area. A comprehensive understanding of the material should be apparent, and clear critical evaluation of major Earth perturbations in a broader context that includes stratigraphy and tectonics.

Criteria	***Pass***	***Credit***	***Distinction***	***High Distinction***
Fossil Fuels	Understand the different types of fossil fuels, their composition, how and where they form including the main components of a petroleum system.	As for Pass but in addition demonstrate a good understanding of the subject area. Demonstrate an understanding of how fossil fuels are generated and how their composition is affected by different types of organic matter, temperature and time.	As for Credit but in addition demonstrate high-level aptitude for the subject area. Understand the major changes in the composition of organic matter as it is converted to fossil fuels and the relationship between kerogen types and macerals.	As for Distinction but in addition demonstrating a flair for the subject area. A comprehensive understanding of the material should be apparent, and clear critical evaluation of a petroleum system in the context of exploration targets.
Structural Geology Introduction Fractures & Faults	Know the meaning of *fact*, *hypothesis*, *model*, *theory*, *law*. Understand the difference between the Baconian and the Darwinian methods. Understand what a *"robust model*" is. Understand the concept of *"structural level*". Know the various type of fractures and faults.	As for Pass, and understand and describe the structural geology workflow. Be able to sketch a normal-dextral or an inverse-sinistral fault. Be able to list a number of kinematic criteria. Understand the concept of tectonic regime.	As for Credit and be able to read fault kinematic criteria, and use fractures and faults to recover the orientation of stress axes, and therefore information about the tectonic regime.	As for Distinction, and be able to write critical, well-articulated and illustrated essay on fractures and faults.
Structural Geology Force, Traction & Stress	Understand the concepts of surface forces and volumes forces. Understand the differences between force, traction and stress.	As for Pass, and understand the difference between the state of stress on a point and that on a surface. Understand the concept of deviatoric stress and how it relates to total stress.	As for Credit, and be able to derive the shear stress from knowledge of total stress acting on a surface. Be able to explain the concept of stress perturbation.	As for Distinction, and be able to write critical, well-articulated and illustrated essay on Force, Traction and Stress
Structural Geology Folds & Folds Systems Boudins & Boudinage	Know the basic descriptors for fold, fold systems and boudins. Know the main planar and linear microstructures associated to folding.	As for Pass and know the concept of vergence and being able to use cleavage/bedding relationship. Understand the concept of fold profile.	As for Credit and be able to process bedding surface data to recover geometrical information about folds and folds systems. Be able to determine in the field the vergence of folds systems.	As for Distinction, and be able to write critical, well-articulated and illustrated essay on Folds & Folds systems, and/or boudinage.
Structural Geology Practicals	Be able to construct a topographic profile from a topographic map. Given a topographic map be able to construct a form line from knowledge of strike-dip-dip direction. Be able to plot on a stereonet canvas lines and planes.	As for Pass and be able to process information from geological maps to recover information about thicknesses. Be able to determine the angle between lines and planes, and the pitch of lines on a plane by processing structural data in a stereonet.	As for Credit and be able to construct accurate cross-section using structural contours. Be able to solve 3D geometrical problems with the stereonet, for instance involving drill cores information.	Be able to construct accurate geological maps by using structural data and given a topographic map.

Lectures, Practicals & Assessment Schedules

Your commitment: We expect you to spend on average of 12 hours per week on this UoS during the 13 teaching weeks of the semester and the study vacation. This time includes:

- Attending all lecture and practical classes (total of 4 hrs/wk, attendance is compulsory).
- Before classes: get ready for lectures and practicals by reading through the material provided to you via Blackboard and other means (min. 2 hours);
- After classes: read through and understand your lecture notes, consolidate your learning by sourcing and digesting complementary information from relevant textbooks, and reliable sources from the Internet (min. 2 hours);
- Work through the practical problems, and write your practical reports (min. 4 hours);

Study Tips: It is up to you to devise a study plan that best suits you. Stick to it, attend all lecture and practical classes and involve yourself in all learning activities, be proactive and engage with your classmates and teachers, they are all here to help you to reach your potential.

Formative assessments are intended to help you monitor your learning and get ongoing feedback (please ask when more feedback is needed). Summative assessments help you demonstrate what you have learned relatively to the goals of the unit of study. While assessments encourage you to work with the material in a timely fashion, they should not dominate your approach to learning. Learn for the joy of learning, not to pass another bloody exam ;)

LECTURES & PRACTICALS SCHEDULE		
	LECTURES - Two 1-hour lecture per week **Mon 10-11 am: Check timetabling** **Wed 10-11 am: Check timetabling**	**LABS - One 2-hour session per week** **Madsen Lab. 336** **Mon - 1-3 pm OR Wed - 1-3 pm**
Module 1: Stratigraphy, Geochronology and Fossils - Dr Adriana Dutkiewicz		
Week 1	**Stratigraphy & Lithostratigraphy**	**Stratigraphic correlation**
Week 2	**Biostratigraphy and Magnetostratigraphy**	**Biostratigraphy**
Week 3	**Geochronology and Introduction to Fossils**	**Magnetostratigraphy**
Week 4	**Archaean and Proterozoic Eons**	**Relative and Absolute Age Dating**
Week 5	**Palaeozoic Eon**	**Taphonomy and Taxonomy**
Week 6	**Invertebrate fossils**	**Yass Fossils**
SMALL EXAM (QUIZ) – during lecture on Monday 4th September		
Module 2: Structural Geology and Tectonics - A/Prof Patrice Rey		
Week 7	**Fractures and faults -** Ch. 1, Ch. 6 & Ch. 8	**Stereonet for 3D geometrical analysis**
Week 8	**Folds and fold systems -** Ch. 10	**Contours, form lines & map analysis**
YASS FIELD TRIP 23rd SEPTEMBER (9am) to 29th (4pm)- A/Prof Patrice Rey		
Week 9	**No lecture or practical - Students work on their reports**	
Week 10	**No lecture or practical to make up for time spend in the field excursion**	
Week 11	**Forces, tractions and stresses -** Ch. 3	**Paleostress analysis**
Module 3: From Fossil to Hydrocarbon and Coal - Dr Adriana Dutkiewicz		
Week 12	**Fossil fuels**	**Petroleum Exploration**
Week 13	**Petroleum from source to reservoir & coal**	**SMALL EXAM - Monday 30th October**

Staff Contact Information: The teaching team is available to you, please ask for help when help is needed. Just send us an email to get an appointment.

Lecturers	**Room**	**Tel**	**Email**
Adriana Dutkiewicz	Rm 431 Madsen	9351 5192	adriana.dutkiewicz@sydney.edu.au
Patrice Rey	Rm 408 Madsen	9351 2067	patrice.rey@sydney.edu.au
Demonstrators			
Andrew Merdith	Rm 244 Madsen		andrew.merdith@sydney.edu.au
Rhiannon Garrett	Rm 244 Madsen		rhiannon.garrett@sydney.edu.au

Assessment schedule: The assessment for this course is based on **formative** (25%) and **summative** (75%) assessments. Late assignments incur a penalty of 10% per day (weekends and holidays included). To satisfactorily complete the course, *all assessments, including field work, have to be completed to a minimum grade of Pass to avoid an Absent Fail*.

	Assessment types*	Indiv. / Group	Due date	Return date (days)	Weight
Week 1	Assignment	Individual	Week 2	7	2.5%
Week 2	Assignment	Individual	Week 3	7	2.5%
Week 3	Assignment	Individual	Week 4	7	2.5%
Week 4	Assignment	Individual	Week 5	7	2.5%
Week 5	Assignment	Individual	Week 6	7	2.5%
Week 6	Assignment	Individual	Week 7	7	2.5%
Week 6	Small Exam	Individual	Mon. lecture	NA	7.5%
Week 7	Assignment	Individual	Week 8	7	2.5%
Week 8	Assignment	Individual	Week 9	7	2.5%
Field Excursion	Skills based evaluation	Individual	end of session	NA	2.5%
Week 9	Assignment	Individual	end of session	NA	17.5%
Week 11	Assignment	Individual	Week 12	7	2.5%
Week 12	Assignment	Individual	Week 13	7	2.5%
Week 13	Small Exam	Individual	Week 13	NA	7.5%
Exam period	Final exam*	Individual	Exam period	NA	40%

**All reports are compulsory and due either at the end of the practical session or at the START (first 10 min) of the practical class of the following week.*

Compulsory attendance & pre-lecture work: Attendance to lectures and practicals is compulsory unless there is a clash with other UoS, or unless special consideration has been granted. Students must come to the lecture prepared by reading the lecture notes and completing pre-lecture activities.

* The final exam comprises short answer questions and exercises covering lectures and practicals. Advanced students will receive variations of some of the practical exercises and slightly different questions in the final exam.

Learning Resources: This UoS is supported by Blackboard for the purpose of communication, discussion, access to recorded lectures.

Course notes can be purchased from USyd Copy Centre
http://sydney.edu.au/ups/ucc/student_notes/index.shtml

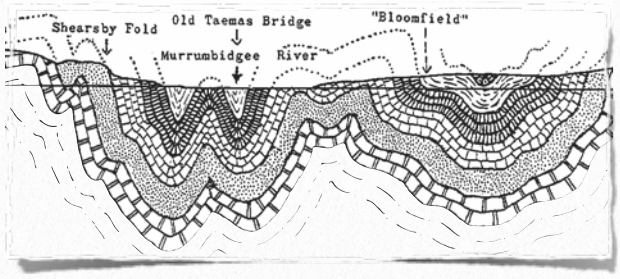
Recommended additional reading for module 1 and 3, available from the SciTech library:

•Boggs S. Jr., 2006. *Principles of Sedimentology & Stratigraphy*. Call #: 552.5 130 A.
•Clarkson, E.N.K., 1998. *Invertebrate Palaeontology & Evolution*. Call #: 562 23 C.
•Doyle, P. 1996. *Understanding Fossils: An Introduction to Inverbrate Palaeontology*. Call #: 562 34.
•Hunt, J.M., 1996. *Petroleum Geochemistry & Geology*. Freeman, p. 256. Call # 553.28 9A.
•Levin, H.L., 2006. *The Earth Through Time*. Call #: 551.7 68 B.

Notes for module 2 (structural geology) are available in a variety of format, first as a website:
http://www.geosci.usyd.edu.au/users/prey/Teaching/Geos-2123/index.html
... as an eBook (for macbook, iPad and iPhone) and finally in as a PDF:
http://www.geosci.usyd.edu.au/users/prey/iBooks/iBooks.html

Module 2 will cover the following sections of Patrice's eBook/website: *Introduction*, *Fractures & Faults*, *Paleostress Analysis*, *Folds & Folds Systems, Boudins & Boudinage*. The other sections (*Shear Zones*, *Fabrics*, and *Strain Analysis*) are covered in GEOS 21(9)14 in the 1st semester.

In addition to Patrice's learning resources, compulsory assessable reading includes chapters 1, 3, 6, 8 and 10 of the following textbook (also used in 3rd yr and available at the bookstore):
Title: *Earth Structure: An Introduction to Structural Geology & Tectonics* (2nd edition)
Authors: Ben A. Van der Pluijm and Stephen Marshak
Publisher: Norton & Company, Inc ISBN: 0-393-92476-X



Yass field trip: The Yass field trip is a major and fun component of GEOS21(9)24 (20% or your final mark).

When: Leaving from Madsen building on **Sat. 23/09** at 9.00 am, returning **Fri. 29/09** ~4 pm. Traveling on minibuses to Yass (stop on the way for lunch), then grocery shopping in Yass before to settle-in at the Good Hope Resort.

Cost: **$400** to cover **transportation & accommodation only** (nb: no discount possible for those traveling with own cars).

Click here to pay online via OnStopWeb before August 4th.

Fieldwork is at the core of all Geoscience disciplines, and field expertise can only be learnt in the field. **If you are aiming at a geoscience major** please do your best to attend the Yass field trip. An alternative exercise will be proposed should circumstances prevent you from attending. Valid excuses include attending a field trip associated to another UoS, attending another USyd event (e.g. sport competition), a medical condition, and duty of care to family members.

Where: The Good Hope Resort is located at 10 km from Yass. Cabins can accommodate up to six occupants, and are equipped with kitchenette (small fridge), shower, toilet, TV. Washing machine facilities and BBQ are available.

What to bring: Warm sleeping bag, gloves, thermals and a warm hat for cold nights and mornings; a broad brimmed hat, sun-glasses, sun-block and lip balm, and your own basic first-aid kit (it must include a couple of pressure bandage for strain ankle, also ideal for snake bite), cold & flu tablets, and a toiletry set. Bring robust and warm clothes. Prefer long-sleeved shirts and pants to T-shirts and shorts. Stout boots are required for fieldwork. A rainproof jacket, as well as a serious dose of good humour in case of prolonged rain, and a water bottle (at least 2 litres). We will stop in Yass for grocery supply before to settle at Good Hope Resort.

Field work items: A field notebook (e.g. a A5 Visual Diary). Lead pencils (HB), color pencils, pens, eraser, protractor, ruler. Hand lens, camera, compass with clinometer (not essential as we will provide them). Geological hammer is not necessary.

Let us know via email (patrice.rey@sydney.edu.au) any medical conditions (e.g. allergies, etc) we should be aware of.

Plagiarism & misconduct, special consideration, marking criterias

This section visits the rules put in place to protect the many who do the right things against the few who compromise, willingly or not, their integrity to get in front.

Ethic?

• *The first step in the evolution of ethics is a sense of solidarity with other human beings.* (Albert Schweitzer, French-German scholar)

• *Education without values makes man a more clever devil.* (Clive Staples Lewis, British novelist and scholar)

• *In looking for people to hire, you look for three qualities: integrity, intelligence, and energy. And if they don't have the first, the other two will kill you.* (Warren Buffet, CEO, Berkshire Hathaway)

Plagiarism Policy - At all times, we are expected to behave in an ethical manner, to be fair and considerate to others, and respect their beliefs, cultures and genders. In the work place, this includes acknowledging properly **other's** people work. You are welcome and encouraged to work in small groups to debate what you have learned, your methodologies and your results, but you cannot present the work of someone else as your own.

In the case of assignments assessed on an individual basis, the data acquisition, the processing of the data, the analysis and presentation of the data, and the writing of the report is an individual affair. When a small team of students is involved in a group assignment, all students are expected to contribute equally to the data acquisition, the processing of the data, the analysis and presentation of the data. Putting the final report together may involve dividing up the work in various sections amongst the team members. However, each member must be involved in the preparation, drafting, and checking of all aspects of an assessable group assignment.

Please ensure you have read the University of Sydney *Plagiarism Policy* which can be accessed from the following website: http://sydney.edu.au/ab/policies/ , and complete the following online module on plagiarism and misconduct:
https://www.library.usyd.edu.au/skills/elearning/learn/plagiarism/index.php

All electronic assignment submissions must include the text provided in the *Student Plagiarism: Coursework - Policy and Procedure Compliance Statement form*. The text must be unchanged except for the students' name(s) and submission date and must appear on the first page of any electronically submitted assignment in order for the assignment to be considered acceptable. The form is available as a word document from the School of Geosciences website:
http://www.geosci.usyd.edu.au/undergrad/ug_acahon.shtml

Text-based similarity detecting software (Turnitin) for all text-based written assignments

Special Consideration - Students who have a serious illness or who have experienced misadventure which may affect their academic performance in this Unit of Study may request that they be given *Special Consideration* in relation to the determination of their results. It should be noted that brief illness or minor misadventure will not warrant *Special Consideration* unless it prevents the student submitting an assessment by the due date, or attending an examination as scheduled.

Please note that *simple extensions will not be granted* in this course and that the application for *Special Consideration* must be submitted within three (3) working days of the due date of the assessment or examination for which consideration is being sought.

Applications for special consideration and special arrangements are managed by the *University's Student Administration Services (SAS)*. You can apply online at this website:
http://sydney.edu.au/current_students/special_consideration/index.shtml

Submitting Reports -

NB: Mandatory use of Turnitin - The University has mandated the use of text-based similarity detecting software (Turnitin) for all text-based written assignments.

When submitting your non text-based reports via email, please keep in mind the following rules:

Use your USyd email address, not your personal email address (hotmail, gmail etc), and in the email subject please refer to the UoS and the report ID (e.g. GEOS-2124 Report Week 7).

Send your reports as a PDF (*Portable Document Format*). PDF was invented to facilitate the sharing of documents across platforms via the Internet. Please reduce the PDF size to a maximum size of 5 mb before sending it. If you don't know how to do this please Google: *How to reduce the size of a PDF document* ...

Instead of naming your report "practical_report" choose this format "UniKey_Lab_nb" e.g "abcd1234_Lab_3". Please write clearly your name and student ID in your report.

When returning a non text-based report in the assignment box in front of the main office, please write clearly the date of return, otherwise penalty will be counted from the due date up to the date when your report was collected.

Marking and Distribution of Grades - Marks for the assessment tasks and grades awarded for the unit conform to the University's assessment policies and procedures. Marks are awarded relative to a set of standards that describe a graduated hierarchy of the levels of achievement. The marks and the various grades *Pass*, *Credit*, *Distinction*, *High Distinction* are described below along with the criteria that will be used to identify the various levels of achievement. Note the acknowledgement of the several sources (e.g. SLS 2014) from which these grade descriptors were modified).

In reference to these grades students should note that:

a) all marked assessment tasks, with the possible exception of practicals, will normally contain at least one item that will enable the full range of achievement levels to be demonstrated, although students should note that some, and perhaps the majority of the individual items, activities or questions presented in each of the assessment tasks will be intended to establish that students have achieved a pass or credit level of achievement.

b) that distinctions and high distinctions would normally only be awarded to students who have performed at a high level in all assessment tasks – in this context '*performed at a high level in all assessment tasks*' means that distinction students will have achieved a credit minimum in all individual items of assessed work and will have achieved a distinction level of achievement (or better) for the majority (>75%) of the assessment tasks. High distinction students will have achieved a distinction minimum in all individual items of assessed work and will have achieved a high distinction level of achievement for the majority (>75%) of the assessment tasks

Fail (Below 50%) - Work may fail for any or all of the following criteria

- No answer or response is provided
- Does not address or otherwise answer the question
- Contains numerous minor errors or presents a significant misconception

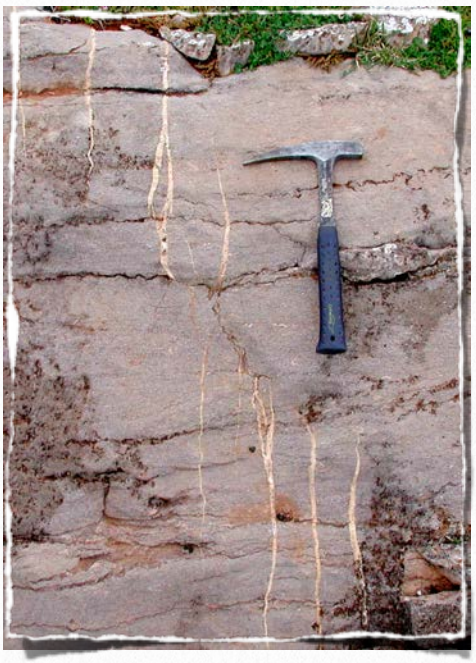
- Presents irrelevant material
- No evidence of research or analysis
- Presents a significantly inaccurate or flawed argument
- The answer is incomprehensible or difficult to understand due to significant problems with grammar, expression or structure

Pass (Between 50% and 64%) - Work awarded a passing grade will usually achieve the following minimum standards or present the described characteristics

- An appropriate but superficial answer or response is provided
- Presents relevant material in a superficial manner or in a simplistic descriptive style
- Correctly identifies key point or points (facts) but does not develop an appropriate explanation or argument if this is required
- Contains some minor errors or presents minor inaccuracies and misconceptions
- Little or no evidence of in-depth analysis or deep understanding of the concept
- Answers can be understood but may be poorly worded or somewhat flawed due to poor grammar, expression or structure

Credit (Between 65% and 74%) - Work awarded a credit grade will usually achieve the following minimum standards or present the described characteristics

- An appropriate, accurate and reasonable detailed answer or response is provided
- Appropriate key point or points (facts) and/or concepts clearly presented without significant errors or misconceptions
- Presents relevant material concisely with facts clearly integrated into the explanation
- Accurate quotation and/or source identification when appropriate.
- Evidence of some independent research or critical analysis of concept or problem
- Answers are easily understood with both clear expression and structure if appropriate



Distinction (Between 75% and 84%) - Work awarded a distinction grade will usually achieve the following minimum standards or present the described characteristics

- Accurately answers the question in a convincing, confident manner
- Presents relevant material accurately in a concise manner or with the facts well-integrated into a comprehensive explanation or argument

- Accurate quotation and/or source identification when appropriate.
- Evidence of extensive independent research
- Evidence of extensive critical analysis of concept, and/or innovative perspective on the topic, and/or deep understanding of problem
- Answers are well written, with clear structure and cogent expression

High Distinction (Above 85%) - Work awarded a distinction grade will usually achieve the following minimum standards or present the described characteristics

- Accurately answers the question in an impressive, compelling, or highly persuasive manner
- Presents relevant material accurately in a thoroughly convincing or forceful manner or with the facts well-integrated into an extended and comprehensive explanation or argument
- Accurate quotation and/or source identification when appropriate.
- Evidence of exhaustive independent research
- Evidence of extensive critical analysis of concept, and/or innovative perspective on the topic, and/or deep understanding of problem
- Answers demonstrate striking originality, an innovative approach, or impressive analytical skill
- Answers are exceptionally well written, with excellent structure expression
- Is otherwise exceptional in some way

The completion of all of the assignments contributes to the *Graduate Attributes* set by the University of Sydney. Graduates of the Faculty of Science will be able to create new knowledge and understanding through the process of research and inquiry, use information effectively in a range of contexts, work independently and sustainably, in a way that is informed by openness, curiosity and a desire to meet new challenges, hold personal values and beliefs consistent with their role as responsible members of local, national, international and professional communities, recognise and value communication as a tool for negotiating and creating new understanding, interacting with others, and furthering their own learning. The assessment tasks of this unit are intended to collectively enhance the above graduate attributes.