



Course Outline

GEOS2131

Field Methods and Mapping

School of BEES

Faculty of Science

T3, 2021

1. Staff

Position	Name	Email	Consultation times and locations
Course Convenor	Martin Van Kranendonk	m.vankranendonk@unsw.edu.au	By appointment

2. Course information

Units of credit: 6UOC

Pre-requisite(s): Assumed knowledge GEOS1211 OR GEOS1111

Teaching times and locations:

Component	HPW	Time	Day	Location
Lecture 1	1	1-2 PM	WED	Online
Lecture 2	1	12-1 PM	THURS	Online
Lab	4	2-5 PM	FRI	TEAMS

2.1 Course summary

Geological mapping is a fundamental tool to the understanding of geology and geological history, and how to unravel geological problems. This course provides the knowledge and skills required to understand and carry out geological field mapping. The course will cover practical geological mapping techniques, general field skills, and the integration of stratigraphic, lithological, structural and palaeontological concepts. Use of remote sensed and geophysical imagery will be included. Due to the Covid pandemic and lockdowns

across Australia, a field component cannot be included. However, this will be replaced by a virtual geological field exercise and the introduction to digital programs that are used in the field.

2.2 Course aims

This course aims to integrate geological knowledge into the creation and understanding of geological maps (2D) and cross-sections (3D), and through this to develop the skills required to unravel the full geological history of geological terrains (sedimentation, volcanology, and structural evolution) through time (4D).

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Understand the importance and components of geological field mapping
2. Identify and employ the concepts of the law of superposition and Walther's Law as applies to basic sedimentary and volcanic rocks
3. Understand the basic types of geological structures and history of deformation in different geological settings
4. Understand the orientation of geological features and their significance
5. Interpret field data and observations to infer stratigraphy and geological history in a mapping area (virtual)
6. Construct a geological map based upon field data and observations
7. Communicate results and ideas in both oral format and as a formal geological report

2.4 Assessment

There are three main assessment components to this course.

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| 1. Stratigraphy assignment – due at end of Week 5: | 30% |
| 2. Summary of Course text “The Map that Changed the World”, and lab participation | 15% |
| 3. Geological map and report derived from Virtual Mapping exercise, and map analysis | 55% |

THERE IS NO FINAL EXAM

2.5 Readings and resources

The Map that Changed the World, by Simon Winchester

Geological Field techniques, by Coe, A.L. (Wiley-Blackwell)

3. Strategies and approaches to learning

3.1 Learning and teaching activities

Mapping is a key skill for the natural sciences, at all scales and with a wide variety of data (geological maps, petrological maps, relationships between data, etc.). It is practiced at all levels and at all scales, and not just in geology. This course is a practical course with learning of theoretical principles, augmented by readings, and practical elements. Lectures introduce you to basic concepts required to undertake mapping and to understand geology as applies to mapping skills. Practical components include: 1) analysis of geological maps; 2) geological mapping using available techniques and technologies. The main assessment tasks relate to developing an understanding of stratigraphy, regional variations, and complications brought about by changes across space and through deformation – real-life geological situations.

3.2 Expectations of students

Students must attend 80% classes and laboratory periods during the term.

Reading of course books is considered mandatory.

Online participation in labs is required.

4. Course schedule and structure

This course consists of 18 hours of class lecture contact hours over 9 weeks of the class (weeks 1-5, 7-10), as well as compulsory laboratory contact.

	Week	Date	LECTURES	Date	LAB
September	1	15.9	Introduction: Course Outline and Why Mapping?	20.2	Geological maps – components, geological history,
		16.9	What's on a map – what can it tell us?		
	2	22.9	What data to collect and how	27.2	Stratigraphy and fence diagrams: Stratigraphy assignment
		23.9	Basics of stratigraphy		
	3	29.9	More on stratigraphy	1.10	The Virtual Mapping Project: Introduction
		30.9	Volcanic facies		
	4	6.10	Intrusive igneous rocks: stratigraphic nomenclature and geochemistry	8.10	Understanding geological structures on maps
		7.10	Fossils and dating		
October	5	13.10	Significance of petrography	15.10	QGIS module
		14.10	Environments of deposition/position in plate tectonic cycle 1		
	6	18-22.10	STUDY WEEK – report on “The Map that Changed the World”		
	7	27.10	Environments of deposition/position in plate tectonic cycle 2	29.10	The Virtual Mapping Project: Questions and Progress
		28.10	Geophysical mapping		
November	8	3.11	Structures and deformation mechanisms	5.11	Drawing geological cross-sections
		4.11	Types of structural fabrics		
	9	10.11	Multiple deformation events and metamorphism	12.11	Map analysis – multiply deformed terrains
		11.11	Different types of geologic map patterns: a plate tectonic and temporal framework		

5. Assessment

5.1 Assessment tasks

Assessment task	Weight	Due date
Assessment 1: Stratigraphy assignment. Each student will be required to undertake a preliminary interpretation of a geological mapping area (Google Earth image) as part of the assessment of the stratigraphy of an area of the Upper Hunter Valley.	30%	Week 5: Friday Oct. 15th 5PM)
Assessment 2: Summary of “The map that Changed the World”	15%	By 9AM Monday Oct 25 th (start of week 7)
Assessment 3: Virtual mapping exercise – geological map and report Geological map assessments	55%	End of Week 10: Friday 19 th November at 5 PM Throughout duration of course

Further information

UNSW assessment policy: <https://student.unsw.edu.au/assessment>

5.2 Submission of assessment tasks

Assessments will be submitted online via Moodle or emailed to the course co-ordinator.

Normal school penalties apply for late submission. The rule is 10% (of the assignment mark) for each day late – up to a maximum of 7 days after which assignment will receive 0. Consideration for relief from this rule can be given only for documented reasons (and student should submit documentation through Student Central).

5.3 Feedback on assessment

Students will receive comments on all submitted work via email.

6. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage.¹ At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site <https://student.unsw.edu.au/plagiarism>, and
- The *ELISE* training site <http://subjectguides.library.unsw.edu.au/elise/presenting>

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>.

7. Administrative matters

School information	<p>School website: http://www.bees.unsw.edu.au/</p> <p>School office – The Biosciences Student Office is where to go for administrative matters relating to BEES courses. It is located on the ground floor of the biological sciences building, room G27. BEESError@unsw.edu.au</p>
Equity and Diversity	<p>Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course Convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or http://www.studentequity.unsw.edu.au/).</p> <p>Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.</p>
Student complaint procedure	<p>http://student.unsw.edu.au/complaints</p>

8. Additional support for students

- The Current Students Gateway: <https://student.unsw.edu.au/>
- Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>

¹ International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>
- Disability Support Services: <https://student.unsw.edu.au/disability-services>
- UNSW IT Service Centre: <https://www.it.unsw.edu.au/students/index.html>