GEOS207

Field and Laboratory Studies in Geoscience

S2 External 2017

Dept of Earth and Planetary Sciences

Contents

General Information

Unit convenor and teaching staff
Dorrit Jacob
dorrit.jacob@mq.edu.au

Bec Dodd
bec.dodd@mq.edu.au

Credit points
3

Prerequisites
GEOS125

Corequisites

Co-badged status

Unit description
This skills-based unit integrates projects, lectures and laboratory classes to develop theoretical knowledge and hands-on experience needed to describe and interpret rocks in the field and laboratory. Field methods involve aerial photograph interpretation, representation of three-dimensional structural data and observations of rock types, rock structures and the relationship between geology and topography. Laboratory methods include geological map interpretation, optical and electron microscopy and geochemical data analysis. The field and laboratory skills are combined to complete an integrated forensic science case study.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections

4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
5. Develop the skills needed to undertake projects of a complex nature
6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
8. Understand how to apply geoscientific principles to understanding the world around you
9. Understand how to access, use and synthesise appropriate information
10. Develop effective team work skills
11. Understand how to present ideas clearly with supporting evidence in a number of formats

General Assessment Information

The assessment consists of several components:

Case study 20%

Online quizzes 10%

Field Trip 20%

Final examination 50%

Assessment Tasks

Name	Weighting	Hurdle	Due
Forensic science part 1	5%	No	25th of September
Forensic science part 2	5%	No	16th of October (week 10)
Forensic science part 3	10%	No	30th of October (week 12)
Online Quizzes	10%	No	each week
Final Examination	50%	No	Week 13
Field Trip	20%	No	during field trip

Forensic science part 1

Due: **25th of September**

Weighting: **5%**

Part 1: Online quiz – download the questions, make the calculations (mineral classifications from EMP and U-Pb data plotting to determine dates) and then complete the quiz (25% of case study)

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Forensic science part 2

Due: **16th of October (week 10)**
Weighting: **5%**

Part 2: Rock table, XRF data and petrographic description (25% of case study)

o Complete the table downloadable from iLearn, with the descriptive geologic sample names (e.g. biotite-muscovite schist) you have determined for the unknown rocks from your petrographic analysis and which unit it most likely matches on the geologic map (if any)

o Plot the XRF data onto the exploration classification figure provided o Write one full petrographic description – with copious illustrations

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Forensic science part 3

Due: **30th of October (week 12)**
Weighting: **10%**

Part 3: History table and report: Interpretation of the geological history of the area (40% of case study) and your main results in the form of a two-page report to the police (10% of case study)

o Complete the A3 size table by hand (download from iLearn), neatly filled out or type into the cells in Excel

o The two-page report should piece together your analysis of the map, the one page from the victim's notebook, the geophysics interpretation, the thin sections, the sand samples and XRF data. Some questions to consider:

• How many unique rock types are there?

• What are the rock types and their mineralogy?

• Do the rock types link to the map or not?

• Are the rock types restricted to a certain area on the map?

• Why, in your opinion, did the geologist have that rock in their car?

• Do any of the rocks match the murder weapon or those used to weigh down the body?

• Does any of the rock analysis help with motive or piecing together the how/where/when of the murder and disposal of the body?

• What were the various sand grains?

• Are they specific to any of the samples analysed petrographically or on the map or have they been kicking around the Earth's surface for a while (stable)?

• Does any of the sand help with motive or piecing together the how/where/when of the murder and disposal of the body?

• Who should the police arrest and why?

• Is there a consistent story or are their multiple options?

• What further investigations or queries should the police make and why?

• If given more time and a further $10,000 consulting fee (wow – you are expensive), what further analyses might you do to clinch a conviction for the police once an arrest was made?

• N.B. Marks will be deducted for reports that are too long – clear and succinct writing is an important skill, valued by professionals. It may take you a few drafts to rewrite your text and fit all of the information into the page limit.

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around

you

- 9. Understand how to access, use and synthesise appropriate information
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Online Quizzes

Due: **each week**
Weighting: **10%**

There will be a series of online quizzes in several weeks. The questions are drawn from the information given in lectures and the unit reader booklet. You will be required to complete a Virtual Petrographic Microscope or stereonet task each week and submit your answers in the weekly quiz.

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Final Examination

Due: **Week 13**

Weighting: **50%**

The final exam will cover material from the lectures, class practical exercises and case studies. Questions will draw on information and ideas from the whole unit to give an integrated view of the unit. The exam will include questions that ask you to apply your knowledge to interpret and solve problems. You will be allowed to take one A4 page of notes into the exam, otherwise it is closed book.

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Field Trip

Due: **during field trip**
Weighting: **20%**

A field guide and detailed assessment tasks will be provided prior to field trip

On successful completion you will be able to:

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and

geomorphology

- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Delivery and Resources

This unit can be seen as three interconnected streams. A lecture stream will give a broad overview of the topics, provide background information and introduce new ideas and concepts that link in with the laboratory practical and case study streams.

There will be one case study submitted in parts throughout the semester. The case study is an extended enquiry into a real geo-scientific problem. This problem is different to the ones that you would typically find in textbooks, and more closely resembles the investigations that scientists face in the real world, with many interacting factors and a number of possible solutions.

The case study will allow you to explore the ideas in depth and will provide an effective and, we hope, enjoyable method of learning. There is also the added benefit of providing you with opportunities to develop generic skills and graduate capabilities such as problem solving, teamwork, communication, accessing and evaluating information and in using scientific approaches to solve problems.

You will be working individually for the case study, both in attempting to solve the problem and to produce a final report. However, you are encouraged to consult with others in the class and to help each other with the work, although, final reports should be done individually. You will be expected to do substantial research outside of the scheduled time (e.g. library and/or web-based literature search, data processing and plotting).

Technology that we will use involves laboratory equipment including petrographic microscopes and geochemical instruments housed in Macquarie Geoanalytical.

Time Allocation

According to Macquarie University guidelines, you are required to spend 39 hours of study percredit point. For GEOS207 this works out to approximately four hours per week at the lecture/ laboratory sessions, and approximately six hours per week doing at home study.

Conscientious use of this time, particularly if it is spread over the whole semester will provide its reward.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 9. Understand how to access, use and synthesise appropriate information
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Assessment tasks

- Forensic science part 1
- Field Trip

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 10. Develop effective team work skills

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3
- Field Trip

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 5. Develop the skills needed to undertake projects of a complex nature

- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information

- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3
- Online Quizzes
- Final Examination
- Field Trip

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 11. Understand how to present ideas clearly with supporting evidence in a number of

formats

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3
- Online Quizzes
- Final Examination
- Field Trip

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3
- Online Quizzes
- Final Examination
- Field Trip

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 2. Develop the skills needed to typify the bedrock controls on landforms and geomorphology
- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 9. Understand how to access, use and synthesise appropriate information
- 10. Develop effective team work skills
- 11. Understand how to present ideas clearly with supporting evidence in a number of formats

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3
- Field Trip

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- 1. Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 10. Develop effective team work skills

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- 2. Develop the skills needed to typify the bedrock controls on landforms and

geomorphology

- 3. Develop the skills needed to utilise the power of back-scattered electron microscopy and petrographic microscopic analysis of thin sections
- 4. Develop the skills needed to interpret the significance of microstructures in geoscience materials
- 5. Develop the skills needed to undertake projects of a complex nature
- 6. Develop the skills needed to describe and analyse simple field structures, including strike/dip of inclined strata, angular relations across unconformities, the style and attitude of folds, and the types of faults and their displacement
- 7. Develop the skills needed to interpret cross-cutting relationships in the field and laboratory to determine the sequence of geoscience events for a given problem
- 8. Understand how to apply geoscientific principles to understanding the world around you
- 10. Develop effective team work skills

Assessment tasks

- Forensic science part 1
- Forensic science part 2
- Forensic science part 3