



Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	PETROLOGY
Unit ID:	SCGEO3102
Credit Points:	15.00
Prerequisite(s):	(SCGEO1103) (At least 105 credit points from ANY subject-area at any level)
Co-requisite(s):	Nil
Exclusion(s):	(SX717)
ASCED:	010703

Description of the Unit:

This unit gives students the opportunity to examine metamorphic and igneous rocks, minerals, and relationships in detail. Students will be exposed to both theory and practical application, as well as field based investigations.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory						
Intermediate						
Advanced			✓			

Learning Outcomes:

On completing this unit, students will be able to:

Knowledge:

- K1.** Communicate the mineralogy of the main igneous rock associations.
- K2.** Explain key magmatic processes.
- K3.** Relate metamorphic processes to lithology and environments
- K4.** Compare and contrast igneous rock classification and nomenclature schemes
- K5.** Categorise metamorphic and igneous minerals and relationships in thin section
- K6.** Relate the optical properties of common rock forming minerals using a standard polarizing microscope to mineral chemistry and structure

Skills:

- S1.** Appraise and classify igneous and metamorphic rocks using a range of nomenclature systems
- S2.** Appraise tectonic significance of igneous rock occurrences.
- S3.** Identify and sketch minerals and rocks using optical microscopy
- S4.** Investigate igneous and metamorphic rocks and minerals and connect to tectonic environments
- S5.** Interpret and appraise mineral and rock textures

Application of knowledge and skills:

- A1.** Interpret, reframe and articulate complex geological concepts to a range of audiences
- A2.** Classify, interpret and connect metamorphic and igneous rocks and processes
- A3.** Articulate the correct use of a polarizing microscope to identify a range of minerals and rock textures

Unit Content:

Topics may include:

- The mineralogy and classification of Igneous Rocks.
- Chemistry - silica content, the saturation concept (silica and alumina). The CIPW norm and its calculation. Feldspathoids.
- Igneous rock associations and suites. Tholeiites, alkaline rocks and calc-alkaline rocks. *Other associations. Chemical variation diagrams etc.
- Magmatic differentiation, fractional crystallisation, assimilation, immiscibility etc.
- Origin of basalts. Partial melting of the mantle and magmatic evolution.
- Tectonic settings of basaltic rocks. MORB`s, IOB`s, Continental and island arc basalts.
- Granites - nomenclature. Naming coarse grained felsic igneous rocks. Mineralogy and its relationship to chemical composition and oxidation state.
- Theories on the origins of granite magmas. Historical development to present day.
- Classification and naming of metamorphic rocks
- Metamorphic facies
- Metamorphism and rock bulk composition
- Theory of polarised light and its interaction with crystalline matter
- Use and application of polarizing microscope to mineralogy
- Basics of crystallography

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, interact and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: <ul style="list-style-type: none"> • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating conflict resolution skills • Working respectfully in cross-cultural and diverse teams. 	K1, K2, K6, S3, A1, A3	AT1, AT2, AT3, AT4
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: <ul style="list-style-type: none"> • Creating a collegial environment • Showing self-awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative 	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: <ul style="list-style-type: none"> • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving 	K3, S4, S5, A1	AT1, AT3, AT4
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: <ul style="list-style-type: none"> • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities 	K4, S1, A2	AT1

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: <ul style="list-style-type: none"> • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life. 	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1,K4-K6, S1-S5. A1- A3	Examination of various key rock suites in both hand specimen and thin section	Laboratory Practicals	30-40%
K3, K4 , S1, S4, A1, A2	Early intervention task - theory test on lecture material	Online test	5-10%
K1, K5, K6, S1, S3, S5, A3	Examination of selected samples in hand specimen and thin section and interpretation of bulk rock chemistry	Practical test	15-25%
K1-K4, S1, S2, S4, A1, A2	Demonstrate level of understanding of key petrological principals and rock associations	Theory test	25-35%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a Course level. Although Units must undertake MiCS mapping, there is NO expectation that Units will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS Course level reporting highlights how each Course embraces the principles and practices associated with the Co-Operative Model. Evidence of Course alignment with the MiCS, can be captured in the Course Modification Form.

MICS Mapping has been undertaken for this Unit No

Date:

Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)