



# Course Outline (Higher Education)

<b>Institute / School:</b>	Institute of Innovation, Science & Sustainability
<b>Course Title:</b>	PETROLOGY
<b>Course ID:</b>	SCGEO3102
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	Successful completion of 120 credit points, including SCGEO1103
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	(SX717)
<b>ASCED:</b>	010703

**Description of the Course:**

This course 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 course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

**Program Level:**

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Learning Outcomes:**

On completing this course, 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

**Course 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

**Values:**

- V1.** Appreciate the variation found in igneous rocks.
- V2.** Appreciate the value of igneous petrography in the study of Earth science.

- V3.** Appreciate the significance of metamorphism in the crust of the Earth.
- V4.** Appreciate the value of petrography in the study of metamorphism.
- V5.** Appreciate the value of optical mineralogy to the understanding of rocks

### Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K6, S1-S5, A1, A2	1-4
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	N/A	Not applicable
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	N/A	Not applicable
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1, K4 - K6, S1, S3, S4, S5, A1	1,3
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	N/A	Not applicable

### Learning Task and Assessment:

Learning Outcomes Assessed	Learning 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%

### Adopted Reference Style:

Australian Harvard

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

Fed Cite - [referencing tool](#)