



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	OPTICAL MINERALOGY
Course ID:	SCGEO2102
Credit Points:	15.00
Prerequisite(s):	(SCGEO1103)
Co-requisite(s):	Nil
Exclusion(s):	(SX617)
ASCED:	010703

Description of the Course:

This course introduces students to the study of minerals and rocks using transmitted and reflected light microscopy. Mineral and rock relationships are studied in detail, and students use rock and mineral microstructures textures to interpret geological relationships.

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"/>
Advanced	<input type="checkbox"/>	<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.** Identify and communicate concepts of the interaction of light with minerals including linking crystalline internal order and symmetry to external crystallographic form
- K2.** Identify and communicate the basic optical properties of minerals and other transparent materials
- K3.** Recognize optical properties of the common rock forming minerals by means of a standard polarizing microscope
- K4.** Discuss the relationship between mineral properties and their paragenesis and provenance

Skills:

- S1.** Operate a polarising microscope in the study of minerals and rocks in thin section
- S2.** Demonstrate familiarity with common minerals including predict mineral properties using knowledge of crystal structures
- S3.** Interpret mineral and rock textures
- S4.** Demonstrate research and communications skills

Application of knowledge and skills:

- A1.** Display proficiency with a polarising microscope
- A2.** Decipher rock microtextures, and communicate results
- A3.** Consult and use mineralogical databases
- A4.** Identify minerals from a range of samples

Course Content:

Topics may include:

- Theory of polarised light and its interaction with crystalline matter.
- The polarising microscope and its application to mineralogy noting the significance of crystallographic principles
- The optical properties of the common rock forming minerals and their classification and significance.
- The paragenesis of the common rock forming minerals.
- Reflected light microscopy, common ore minerals and their paragenesis
- Lattice and crystal symmetry and classification, miller indices, crystal spatial information and space groups.

Values:

- V1.** Appreciate the value of optical mineralogy to the basic understanding of the nature of rock materials
- V2.** Develop a professional attitude to mineralogy and its application

Graduate Attributes

The Federation University FedUni 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, K3, K4, S1, S2, S3, A1, A2, A3, A4	1, 2, 3, 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.	Not applicable	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.	Not applicable	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.	K2, S4	1
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.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, K3, S1, S2, S3, S4, A1- A4, V1, V2	Submission of a range of practical assignments pertaining to crystallography, the use of the Polarising microscope to identify minerals and rocks and to interpret rock textures.	Practical Exercises/Work	20-40 %
K1-K4, A3, S2	Present understanding of key concepts of mineral identification using a microscope including crystallographic significance.	Report	10%
K1-K4, S2, S3, A1, A2, V1, V2	Assessment of students comprehension of key theoretical concepts linking transmission and reflected light microscopic identification of minerals, as they relate to mineral paragenesis and interpreting geology.	End of semester Theory Test(s)	20-30 %
S1-S4, V1-V2, K1-K3, A1, A2, A4	Assessment of students ability to effectively use the polarising microscope to identify minerals, interpret mineralogy and textures to assist in interpreting geology.	Practical test(s)	20-30%

Adopted Reference Style:

Australian Harvard

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

Fed Cite - [referencing tool](#)