Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	ENGINEERING GEOLOGY
Unit ID:	SCGEO3110
Credit Points:	15.00
Prerequisite(s):	(Any two of SCGEO1104, SCGEO1105, SCGEO2103, SCGEO2106) (SCGEO1103)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	010703

Description of the Unit:

Engineering geology gives students the opportunity to appreciate the importance of geological input to major engineering projects. Student will experience hands-on activities that link geology and geological hazards to risk assessment and engineernig projects, and will get the opportunity to observe a range of geological hazards and engineering works in a field setting. The course provided real examples and prepares graduates for real tasks they might undertake in engineering geology.

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:

Engineering geology provides students the the opportunity to examine geological elements as they relate to engineering projects. The course consists of a mix of theory, practical and site visits, and prepares students for industry through the use of real-world examples and exercises.

Knowledge:

K1. Evaluate the aspects of geology that are important to civil and mining engineering projects; environmental investigations; and water resource investigations.

K2. Appriase soil and rock properties for engineering purposes.

K3. Justify the importance of geological hazard identification and prediction for the planning of engineering infrastructure.

K4. Discuss the terminology, concepts and principles of engineering geology.

Skills:

S1. Collect data in both a field and laboratory setting.

S2. Investigate engineering geology problems using a range of tools, applying a risk management approach

S3. Communicate the results of an engineering geology investigation to a range of audiences

Application of knowledge and skills:

A1. Collect and analyse engineering geological data using relevant tools

A2. Evaluate engineering projects using a risk management approach by applying engineering geological principles and tools

A3. Produce a comprehensive written report on the results of an investigation into an engineering project

Unit Content:

Topics may include:

- Introduction to Engineering Geology and the geotechnical applications in geology.
- Industrial context: Cities and geology; agriculture and geology; mining and geology.
- Land capability, land-use planning, predicting the environmental impact of engineering projects.
- Soil: composition, texture, structure, fabric, consistency, engineering classification, stress and strain, consolidation, shear strength, compaction, and density.
- Rocks and rock mass: engineering classification, mechanical properties.
- Rock mechanics: rock slopes, underground mines, tunnels.
- Engineering Geology Applications: slope stability, foundations, dams, mines & quarries, coastal structures, offshore structures, site selection, engineering-geological mapping.
- Engineering geological conceptual models
- Developing risk registers
- Risk Assessment
- Terrain models
- The role of geospatial data in engineering geology

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**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be 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: • 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.	K3, K4, S3, A2, A3	AT1, AT2, 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: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	S2, A2	AT2, AT4
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: • 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	K1, K3, A2, A3	AT1, AT2, 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: • 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	S1, S2, A1, A2	AT1, AT4

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: • 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.	K1, A3	AT1, AT4

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K4, S1-S3, A1-A3	Practical exercises	production and interpretation of geological maps and cross sections	20-30%
K1, K2, K4, S1, S2, A1, A2, V1, V2	Field excursion	Attendance on field excursion	S/U
K2, K4, S1, S2, S3, A1, A2, V1, V2	Field exercises	Field mapping and hazard identification Report	20-30%
K1-K4, S1-S3, A1-A3, V2	Major assignment	Engineering geology investigation report	40-50%

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