

Course Outline

Title: ENGINEERING GEOLOGY

Code: SCGEO3110

Formerly: SX733

Faculty / Portfolio: Faculty of Science

Program Level:

	AQF Level of Program					
	5	6	7	8	9	10
Level						
Introductory						
Intermediate						
Advanced			✓			

Pre-requisites: SCGEO1102 or SX511 and SCGE2103 or SX618

Co-requisites: Nil

Exclusions: (SX733)

Progress Units: 15

ASCED Code: 010703

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:

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- 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

Values and Graduate Attributes:

Values:

- V1.** Appreciate the importance of the application of geology to engineering projects
- V2.** Understand the legal and moral responsibility of providing quantitative geological data to geotechnical and engineering projects.

Graduate Attributes:

Attribute	Brief Description	Focus
Continuous Learning	This course provides students with the opportunity to expand their understanding of the application of geology by focusing of the use of geological principles in the investigation of engineering project. As such the course highlights the interdisciplinary nature of many projects in modern society and provides students with the impetus to develop interests in related fields, and thus foster a desire to further their knowledge.	High
Self Reliance	Early in this course students are guided through examples and scenarios relating to engineering geological applications in engineering projects. As the course progresses students are expected to show self reliance and independently collect data and report results using risk management principles. Students develop self reliance through managing their workload and scheduling their workload so as to be able to submit assessment tasks to tight deadlines.	High
Engaged Citizenship	Students are given the opportunity to appreciate the importance of geological understanding to engineering projects, and be able to advocate for, and explain the important role played by applying engineering geology principles to engineering problems. The course aims to produce graduates who are able to engage in debates regarding risk management in society, and specifically, its application to engineering projects.	Medium
Social Responsibility	This course provides students with an insight into the role of engineering geology in major engineering projects, and as such, it also highlights the importance of such projects to society. Students will also examine the role of a risk management approach to engineering projects and appreciate their legal and ethical responsibility in providing advise of such projects.	Medium

Content:

Topics may include:

- Introduction to Engineering Geology and the geotechnical applications in geology.

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- 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

Assessment:

Learning Outcomes Assessed	Assessment Task	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%

Adopted Reference Style:

Australian

Presentation of Academic Work:

<https://federation.edu.au/students/assistance-support-and-services/academic-support/general-guide-for-the-presentation-of-academic-work>