



Course Outline (Higher Education)

Institute:	Institute of Innovation, Science & Sustainability
Course Title:	INTRODUCTION TO GEOTECHNICAL ENGINEERING
Course ID:	ENGIN2204
Credit Points:	15.00
Prerequisite(s):	(ENGIN2301)
Co-requisite(s):	Nil
Exclusion(s):	(ENCIV2330)
ASCED:	030911

Description of the Course:

All aspects of geoen지니어ing are considered at an elementary level, as well as basic engineering geology, formation and weathering processes, sedimentary, igneous and metamorphic rocks, the geotechnical spectrum - soil, rock, weathering, deposition cycle, basic soil and rock properties, void ratio, water content, for example, and the two phase model. All materials are assumed to be granular and frictional. The course includes the soil description and geological mapping, rock mass classification, soil classification and phase relationships, stress and strain in soils, stress paths, shear failure of soils and analysis and design of shallow foundation. A clear emphasis on sustainable design will be made.

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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Advanced	■	■	■	■	■	■

Learning Outcomes:

On completion of the course students will be able to:

Knowledge:

- K1.** Recognize the importance of geotechnical engineering in the broader civil engineering discipline
- K2.** Identify and Explain various geological features and their effects on geotechnical engineering systems
- K3.** Recognize the fundamental principles of soil mechanics
- K4.** Explain soil compaction and ground improvement techniques
- K5.** Explain soil compressibility and shear strength

Skills:

- S1.** Classify and Examine soils for various civil engineering applications
- S2.** Explain the effective stress concept and its influence on soil behavior
- S3.** Analyze and Design basic earth retaining structures
- S4.** Interpret laboratory data to Determine soil physical and mechanical properties

Application of knowledge and skills:

- A1.** Solve a range of geotechnical problems involving water flow, soil settlement/consolidation and soil strength
- A2.** Measure basic soil properties in the laboratory for soil classification purposes
- A3.** Produce reports of geotechnical designs and laboratory test results at a professional standard

Course Content:

Topics may include:

- Geological Processes and Geological Mapping
- Soil Classification for Engineering Purposes
- Soil as a Three-Phase System — Phase Relationships
- Ground Improvement and Soil Compaction
- Stresses and Strains in Soils
- Permeability of Soils
- Shear Strength of Soils
- Compressibility and Settlement of Soils
- Lateral Earth Pressures

Values:

- V1.** Recognise the importance of sound understanding of fundamental principles in order to apply theory appropriately in practice.
- V2.** Appreciate the importance of careful planning and execution of site investigations in order to minimise economical risks and occupational hazards.
- V3.** Recognise the challenges associated with the design of rock and soil slopes.

V4. Appreciate the variation of ground conditions on the section and design of geotechnical structures.

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,S4	1
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.	K6, S4	1,2,3
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-K6, S1-S4	1,2
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-K6, S1, S2, S3, A1, A2, A3	Case studies, Laboratory and Field information/ reports based work	Analysis/ evaluation Reports	10 - 20%
K1-K6, S1-S4, A1-A3	Stress distribution in soils, soil strength and compressibility analysis, bearing capacity of foundations	Written assignment	25 - 45%
K1-K6, S1-S4, A1-A3	All the topics covered in the course will be accessible.	Mid semester and/or End of semester Test(s)	40 - 60%

Adopted Reference Style:

Other (Refer to the library website for more information: IEEE)

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

Fed Cite - [referencing tool](#)