Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Geotechnical Engineering 2
Unit ID:	ENGRG3102
Credit Points:	15.00
Prerequisite(s):	ENGRG2102
Co-requisite(s):	Nil
Exclusion(s):	ENGIN3202
ASCED:	030999

Description of the Unit:

This is an intermediate level unit in geotechnical engineering where more in depth knowledge in this field is introduced and basic foundation design skills are excelled. The topics covered include, geotechnical site investigation practices, an introduction to AS2870 Residential Slabs & Footings, analysis and design of shallow foundations, analysis and design of deep foundations, and analysis of slope stability and design of retaining structures. By the end of this unit, students should be capable of preparing a small-scale site investigation program, classifying residential building sites based on AS2870 and proposing suitable footing systems for residential buildings, design basic shallow and deep foundations under simple loading conditions, as well as analyse soil slope stability and design retaining structures.

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:

To develop and broaden an understanding of the geotechnical engineering design & practice principles and their application in the investigation, modelling, analysis and design of some common geoengineering systems (shallow foundations, deep foundations, residential footings, retaining structures and landfill systems).

Knowledge:

K1. Identify and explain the range of important issues in the planning of a detailed geotechnical site investigation programs

K2. Identify and evaluate reactivity characteristics of soils, classification of residential building sites and design of residential building foundations based on AS2870 : Residential Slabs & Footing

K3. Describe and apply design principles of Shallow foundations, Deep foundations and Retaining walls subjected to different loading conditions & soil conditions

K4. Explain and analyse soil slope stability

Skills:

S1. Propose and plan a site investigation for a small to medium scale geotechnical engineering project and produce a technical report to an acceptable professional standard

S2. Evaluate and justify complex information in classifying residential building sites based on soil reactivity

S3. Analyse soil-foundation systems, estimate allowable bearing capacity of soils based on established engineering methods and design of simple foundation systems for given loading conditions and soil properties

S4. Evaluate stability of sloping embankments and design of basic earth retaining structures

Application of knowledge and skills:

A1. Apply the knowledge, technical and analytical skills to independently analyse and design various geotechnical engineering systems and communicate the achieved outcome

A2. Apply the advanced technical knowledge and skills in research based problem solving exercises in geotechnical engineering and demonstrate expert judgement required in such assignments

Unit Content:

Topics may include:

- Geotechnical Site investigation Practices and planning for soil exploration
- Site Classification and design of Residential building foundations based on AS2870
- Bearing Capacity Analysis and Design of Shallow Foundations
- Design of Deep Foundations
- Soil Slope Stability Analysis
- Design of Retaining Structures

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, S1, A1	Geotechnical soil investigation (Field / Laboratory investigations) and preparation of Geotechnical Reports	Field/ Laboratory investigations and reports	10-20%
K2-K3, S2- S4, A1, A2	Design of Residential Building foundations based on AS2870, design of Shallow & Deep foundations & retaining structures	Design reports, presentations	20-40%
K1-K4, S2- S4, A1, A2	Assessment of all or part of the unit by tests/ examination.	Test/ Examination	40-60%

Adopted Reference Style:

IEEE

Refer to the library website for more information

Fed Cite - referencing tool