Course Outline

School / Portfolio: Faculty of Science and Technology

Course Title: INTRODUCTION TO GEOENGINEERING

Course ID: ENGGC2206

Credit Points: 15.00

Prerequisite(s): (ENGGC1210)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED Code: 031199

Program Level:

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

Learning Outcomes:

The student is expected to acquire a basic knowledge and understanding of the methods and processes of geoengineering

Knowledge:

- **K1.** Identify and describe various geological features and their effect on geotechnical engineering systems
- **K2.** Classify rock and soil for engineering purposes
- **K3.** Determine soil and rock properties using various testing techniques
- **K4.** Describe soil and rock strength using different failure criteria
- **K5.** Determine bearing capacity of shallow foundations considering ultimate and serviceability design criteria

Skills:

- **S1.** Interpret relevant data and information from geological maps in order to appropriately use them in geotechnical engineering design projects
- **S2.** Identify and classify soil and rock for engineering purposes
- **S3.** Carry out laboratory tests for physical and mechanical properties of soil and rocks
- **S4.** Analyze and design of shallow and pile foundations

Application of knowledge and skills:

- **A1.** Use laboratory and insitu techniques to classify soil for engineering purpose

A2. Analyze soil reaction to various loading conditions

A3. Apply the technical knowledge and skills in solving geotechnical problems to demonstrate the ability of designing safety foundation systems

Course Content:

Topics may include:

- Geological Processes
- Geological Mapping
- Rock properties
- Three Phase Relationship
- Soil Classification
- Laboratory test for soil classification
- Stresses in soils
- Mohr circle
- Shear strength of soil and Mohr- Coulomb's failure criteria
- Foundation systems
- Bearing capacity and settlement of shallow Foundations
- Bearing capacity of single pile

Values and Graduate Attributes:

Values:

V1. Recognize 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 minimize economical risks and occupational hazards

V3. Recognize 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:

Attribute	Brief Description	Focus
Continuous Learning	The course will motivate students to appreciate the importance of life-long learning to expand their knowledge and expertise.	Low
Self Reliance	Students will rely on their abilities for the major part of this course in terms of acquiring and sorting out information needed for the assessment tasks.	Low
Engaged Citizenship	Lows and regulations relevant to building codes and standards will be discussed and reflected upon in this course	Low
Social Responsibility	The course will reflect on social responsibilities of civil engineers in terms making sure proposed development do not put existing resources and communities at risk.	Low

Learning Task and Assessment:

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Learning Outcomes Assessed	Assessment Task	Assessment Type	Weighting
K1, K2, K3, S1, S2, S3, A1	Case study and Laboratory work	Report on field laboratory tests	15%
K1, K2, K3, K4, K5, S1, S2, S3, S4, A1, A2, A3	Stress distribution in soils, soil strength analysis, bearing capacity of foundations	Written assignment	30%
K1, K2, K3, K4, K5, S1, S2, S3, S4, A1, A2, A3	All the topics covered in the course will be examinable.	Close book written exam	55%

Adopted Reference Style:

APA