School of Engineering

CIVL4571: Geotechnical Engineering Project

Singapore BCA and Callaghan
Semester 2 - 2023

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

COURSE OUTLINE

www.newcastle.edu.au
CRICOS Provider 00109J

OVERVIEW

Course Description

Provides a practical introduction to research and design techniques in geotechnical engineering. An open-ended, integrated, practical problem is considered. Emphasis is on a realistic design problem. Problems are set by practising engineers.

Requisites

This course is only available to students enrolled in one of the programs:

[12282] Bachelor Engineering(Hons)(Civil)/Bachelor Engineering(Hons)(Surveying)
[12288] B Engineering (Honours) (Civil)
[12289] Bachelor of Engineering (Honours)(Civil)/Bachelor of Business
[12290] Bachelor of Eng (Hons)(Civil)/Bachelor of Eng (Hons)(Environmental)
[40054] Bachelor of Civil Engineering (Honours)
[40082] Bachelor of Civil Engineering (Honours)/Bachelor of Business
[40083] Bachelor of Civil Eng (Honours)/ Bachelor of Environmental Eng (Honours)
[40084] Bachelor of Civil Engineering (Honours)/Bachelor of Mathematics
[40085] Bachelor of Civil Engineering (Honours)/Bachelor of Surveying (Honours)
[40353] Bachelor of Civil Eng (Honours)/ Bachelor of Environmental Eng (Honours)
[40354] Bachelor of Civil Engineering (Honours)
[40356] Bachelor of Civil Engineering (Honours)/Bachelor of Business
[40357] Bachelor of Civil Engineering (Honours)/Bachelor of Mathematics
[40358] Bachelor of Civil Engineering (Honours)/Bachelor of Surveying (Honours)

Students must have successfully completed CIVL4201.

Assumed Knowledge

CIVL2280 Geomechanics 1 or CIVL2282 Introduction to Geomechanics and CIVL1200 Earth Systems
CIVL3280 Geomechanics 2
CIVL4201 Geotechnical and Geoenvironmental Engineering

Contact Hours

Lectorial
Face to Face On Campus
78 hour(s) per Term Full Term
This will comprise 13 weeks x 6 hrs per week (2 x 3 hr sessions)

Unit Weighting	10
Workload	Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

CONTACTS

Course Coordinator

Singapore BCA and Callaghan
Prof Olivier Buzzi
Olivier.Buzzi@newcastle.edu.au
(02) 4921 5454
Consultation: Open door policy but it is best to send me an email to make an appointment.

Teaching Staff

A/Prof George Kouretzis (georgios.kouretzis@newcastle.edu.au)
BCA: Dr. Kar Winn (Winn.Kar@newcastle.edu.au)

School Office

School of Engineering
EAG02
EA Building
Callaghan
+61 2 4921 5798
9.00am-1.00pm and 2.00pm-5.00pm (Monday to Friday)
School of Engineering (Callaghan)
SENG-ADMIN@newcastle.edu.au
+61 2 4921 5798

SYLLABUS

Course Content

GROUP DESIGN WORK
Conceptual design:
- Identify feasible solutions to an integrated problem
- Identify potential difficulties and consider planning issues

Geotechnical design:
- Philosophies for site investigation and developing geotechnical site models
- Analysis and design of geotechnical structures including soil retaining systems, water exclusion/retention structures, deep and shallow foundations, slope stabilisation and strategies for environmental contaminant investigation and remediation

Management of team activities:
- Student teams are encouraged to maintain a design time sheet/diary in which all members sign off weekly on work done by each individual and time taken to complete that work. The diary may be submitted with the final report.

INDIVIDUAL PROFESSIONAL DEVELOPMENT
Exposure to professional and research practice:
- Students are invited to attend a series of seminars by practising engineering specialists and academics on specific topics related to their projects.
- Students are required to undertake a formal review of the work carried out by a fellow group member.

Course Learning Outcomes

On successful completion of this course, students will be able to:
1. Integrate and extrapolate the theory presented in earlier courses to solve a broad range of real problems.

2. Apply research and design skills to model and understand complex geotechnical systems and to solve open-ended geotechnical problems.

3. Work as part of a team in the solution of problems that are posed and directed by experienced practising engineers and academics.

4. Incorporate design tools such as standards and software in the formulation of solutions to real problems and explore the limitations of these tools.

5. Critically analyse and communicate outcomes at a professional level, both verbally and as a report.

Course Materials

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

-

Course Assessment Requirements:

- Assessment 2 - Written Assignment: Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course. Fail criterion on the individual technical section of the final design report. Students are required to obtain a mark equal to or above 50/100 for the individual technical section of the final design report and an overall course mark equal to or above 50 to pass the course.

Pre-Placement Requirements:

-

ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Geotechnical Model Formulation (Preliminary Report)	11/08/2023	Group	20%	1, 2, 3, 5
2	Final Design Report*	13/10/2023	Combination	60%	1, 2, 3, 4, 5
3	Peer Review Task	17/10/2023	Individual	20%	3, 5

* This assessment has a compulsory requirement.

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Geotechnical Model Formulation (Preliminary Report)

Assessment Type Written Assignment

Purpose The purpose of this assessment item is for you to define the scope of the project, to identify the geotechnical problems you will have to solve and to analyse the data given to you in order to formulate a relevant geotechnical model, that will enable you to solve the design problem.

Description In this part of the project, you will be given about 4 weeks to produce a geotechnical

	interpretative report presenting the key considerations for the project and the geotechnical model (cross sections) with all relevant soil parameters.
Weighting	20%
Length	Unspecified
Due Date	11/08/2023
Submission Method	In Class Online Students are required to submit one hardcopy in class, during the session, AND one softcopy on Canvas
Assessment Criteria	See section on Course and Assessment structure
Return Method	In Person
Feedback Provided	In Class - .

Assessment 2 - Final Design Report

Assessment Type	Written Assignment
Purpose	The purpose of this assessment item is to produce design recommendations (technical solution) to satisfy the design brief.
Description	The report will present the design recommendations related to each task, as a section of a larger group report. The technical solution will involve a combination of hand calculations, computer analyses and qualitative analyses/specifications and construction advice. The final report should look like it was produced by a single author (design team from a professional organisation), and not a collection of random projects cobbled together in a common binder. Weekly progress reports from students will have to be submitted online (Canvas), as this is normal professional practice. The report quality/presentation mark of the report will account for the submission of these progress reports. To assess students' progress during the course, the teaching team may conduct group interviews during timetabled sessions. Arrangements for these interviews will be communicated to the students in due time via Canvas. The report will be worth 60% (40% individual + 20% group)
Weighting	60%
Compulsory Requirements	Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course.
Length	Unspecified
Due Date	13/10/2023
Submission Method	In Class Online Students are required to submit a hardcopy AND a softcopy on Canvas
Assessment Criteria	See section on Course and Assessment structure
Return Method	In Person
Feedback Provided	In Class -. Feedback sessions to be held on the 06/11/2023
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment. If a student fails by virtue of the fail criterion but has obtained a mark equal to or above 35/100 for their individual technical section, they will be given the opportunity to resubmit this section. The course mark will be capped at 50/100 if a student passes the course following re-submission of the individual technical section of the final design report.

Assessment 3 - Peer Review Task

Assessment Type	Written Assignment
Purpose	Peer review for the purposes of quality assurance is a fundamental aspect of professional engineering practice, and it aligns well with the research training expectation of an honours degree, since critical assessment of research outcomes is a basic research skill.
Description	In this part of the project, you will be given ~4 days to review a section of your final report completed by one of the other team members
Weighting	20%
Length	2 pages maximum
Due Date	17/10/2023
Submission Method	Assignment Boxes Assignment boxes in EA foyer (1st floor)
Assessment Criteria	See section on Course and Assessment structure

Return Method	In Person
Feedback Provided	Returned Work - .

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Communication Methods

Communication methods used in this course include:

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;

3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:
https://policies.newcastle.edu.au/document/view-current.php?id=236

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures that support a safe and respectful environment at the University.

Graduate Profile Statements

This course builds students' capacity in the following University of Newcastle Bachelor of Engineering Graduate Profile Statements (based on 2011 Engineers Australia revised Stage 1 Competency Standards for Professional Engineers):

UON Att.	University of Newcastle Bachelor of Engineering Graduate Profile Statements/ Engineers Australia Stage 1 competency statements	Taught	Practised	Assessed	Skill Level (1-4)
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability	☑	☑	☑	4
12	3.2. Effective oral and written communication in professional and lay domains.		☑	☑	4
13	3.3. Creative, innovative and pro-active demeanour.		☑	☑	3
14	3.4. Professional use and management of information.	☑	☑	☑	3
15	3.5. Orderly management of self, and professional conduct.		☑	☑	3
16	3.6. Effective team membership and team leadership.		☑	☑	3
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	☑	☑	☑	4
8	2.2. Fluent application of engineering techniques, tools and resources.		☑	☑	4
9	2.3. Application of systematic engineering synthesis and design processes.	☑	☑	☑	4
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.	☑	☑	☑	2
	Knowledge Base				
1	1.1. Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.		☑	☑	4
2	1.2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.		☑	☑	4
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	☑	☑	☑	4
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.	☑	☑	☑	4
5	1.5. Knowledge of contextual factors impacting the engineering discipline.	☑	☑	☑	3
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.	☑	☑	☑	3

This course outline was approved by the Head of School on the 28/06/2023. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.