

School of Civil and Environmental Engineering

Term 3, 2021

**CVEN4204**

# **GROUND IMPROVEMENT AND MONITORING TECHNIQUES**

**Units of Credit**            6  
**Contact hours**            5 hours per week  
**Lecture**

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**Problems relevant to the lectures will be solved each week in the workshops.**  
**The assumed knowledge of the course is Soil Mechanics and Applied Geotechnical Engineering.**  
**<https://www.handbook.unsw.edu.au/undergraduate/courses/2021/CVEN4204/>**

**Assessment of the suitability and design of stabilisation techniques for difficult foundation soils including instrumentation and application of observational techniques to geotechnical engineering. Topics covered will include: principles of the observational method, instrumentation, selected lectures on braced excavations, dewatering, grouting, underpinning, stone columns, vertical and horizontal drains, vacuum pumping, deep compaction, vibro floatation, lime stabilisation, reinforced earth and soil nailing.**

## TEACHING STRATEGIES

The contents of this subject will be presented in a series of lectures, followed by examples/exercises. The lectures explain the theory and design recommendations. They tend to engage students in formal and informal discussions to broaden their understanding of different problems related to Geotechnical Engineering. Students are required to do extra research into the topics related to ground improvements not covered in the lecture.

An example of the approaches to learning is:

<b>Lectures</b>	<ul style="list-style-type: none"><li>x Find out what you must learn</li><li>x Follow worked examples</li><li>x Hear announcements on course changes</li><li>x Research on topics not covered in the student notes</li></ul>
<b>Exercises</b>	<ul style="list-style-type: none"><li>x Be guided by Lecturer</li><li>x Practice solving set problems</li><li>x Ask questions</li></ul>
<b>Private Study</b>	<ul style="list-style-type: none"><li>x</li></ul>



**ASSESSMENT OVERVIEW**

<b>Item</b>	<b>Length</b>	<b>Weighting</b>	<b>Learning outcomes assessed</b>	<b>Assessment Criteria</b>	<b>Due date and submission requirements</b>	<b>Deadline for absolute fail</b>	<b>Marks returned</b>
1. Online test	a1 h	10%	1-3, 5-6	Weeks 1 and 2, 3	04/10/2021	NA	08/10/2021
2. Quiz #1	1.5-2 h	35%	1-3, 5-6	Weeks 2, 3 and 4	Week 5	Week 5	Week 8
3. Project presentation	10 min each	20%	1-3, 5-6	NA	01/11/2021	Week 8	Week 10
3. Quiz #2	1.5-2 h	35%	1-3, 5-6	Weeks 7, 9	Week 10	Week 10	End of Term

Note 1: Attendance in all quizzes is compulsory.

Note 2: There will not be any alternative quiz for those who miss one.

No textbooks are required as the topics covered in this course can be found in many books on ground improvement techniques. The following reference books may be useful for additional reading.

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## ACADEMIC ADVICE

For information about:

- x Notes on assessments and plagiarism;
- x Special Considerations: [student.unsw.edu.au/special-consideration](https://student.unsw.edu.au/special-consideration);
- x General and Program-specific questions: [The Nucleus: Student Hub](#)
- x Year Managers and Grievance Officer of Teaching and Learning Committee, and
- x CEVSOC/SURVSOC/CEPCA

Refer to Academic Advice on the School website available at: <https://>

**Appendix A: Engineers Australia (EA) Competencies**

Stage 1 Competencies for Professional Engineers

	<b>Program Intended Learning Outcomes</b>
<b>PE1: Knowledge and Skill Base</b>	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
<b>PE2: Engineering Application Ability</b>	PE2.1 Application of established engineering methods to complex problem solving
	PE2.2 Fluent application of engineering techniques, tools and resources
	PE2.3 Application of systematic engineering synthesis and design processes
	PE2.4 Application of systematic approaches to the conduct and management of engineering projects

**PE3: Professional and Personal**