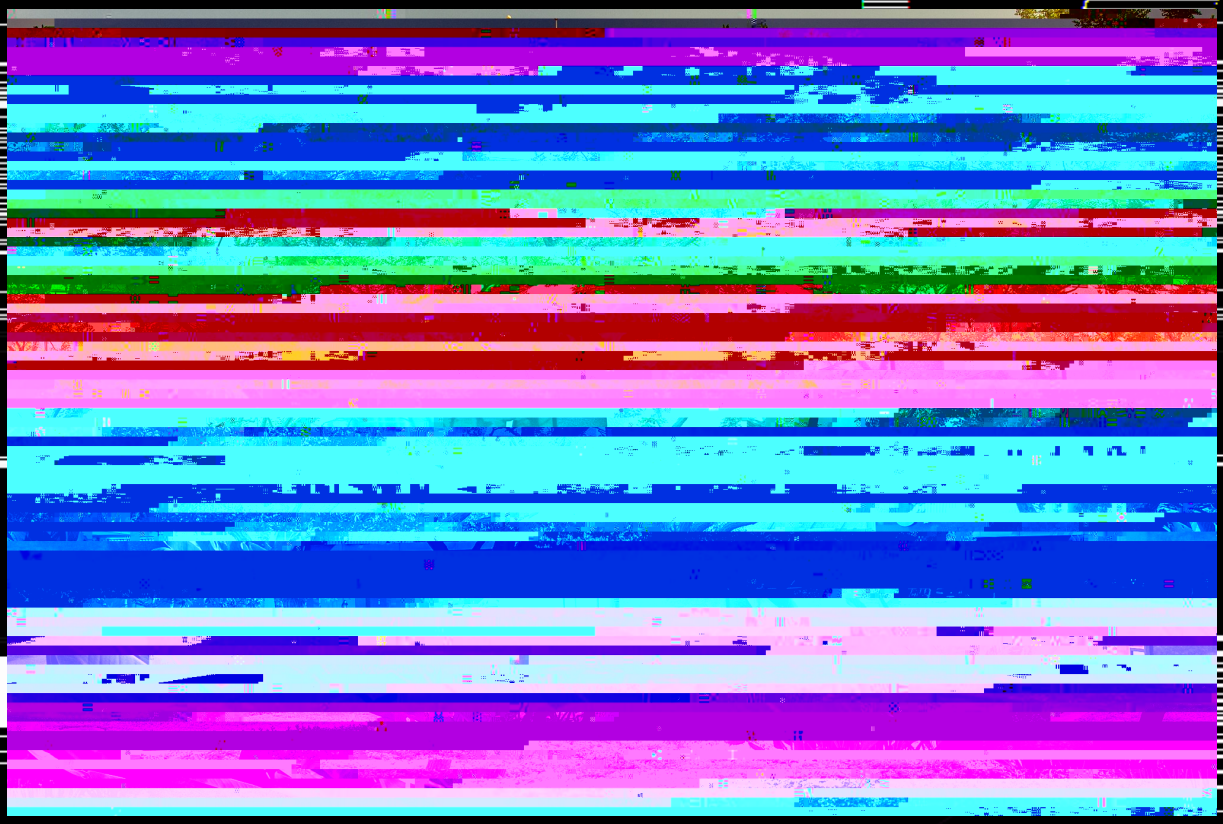
CVEN3202

Soil Mechanics

Term 3, 2022



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Arman KHOSHGHALB	arman.khoshghalb@unsw.edu.au	Fridays from 3 pm to 4:30 pm	CE503	

School Contact Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

Course Details

Units of Credit 6

Summary of the Course

An introductory course to fundamentals of soil mechanics. Topics include: description of soil, basic phase relationships, clay mineralogy, confined and unconfined seepage, principle of effective stress, consolidation theory, compaction, stress distribution and settlement, Mohr circle, failure criterion, strength of soils, soil testing, stress-strain behaviour of soils and slope stability.

Course Aims

The objective of the course is to understand the basic principles of soil mechanics and to study the behaviour of soil as an engineering material, both theoretically (through lectures) and practically (through laboratory classes).

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies

Assessment

Assessment task			

Hurdle requirement

		qccn_ec'
Week 6: 17 October - 21 October	Reading	No Lecture (Flexibility week) No Workshop
Week 7: 24 October - 28 October	Lecture	Rate of consolidation, Shear strength of soils Quiz 2 (weeks 2 to 4 materials) Laboratory 3 module will be released. Workshop 5 *Pcjc_qc md jc_p l g l e k mbsjc 3 &P_rc md am l qmjgb_rgm l '*
Week 8: 31 October - 4 November	Lecture	Shear strength in soils (cont.), Direct shear test Workshop 6 *Pcjc_qc md jc_p l g l e k mbsjc 4 &K m f p+Amsjm k ` d_gjspc apgrcpgm l '*
Week 9: 7 November - 11 November	Lecture	Triaxial test, Stress path technique Laboratory 4 module will be released. Workshop 7 *Pcjc_qc md jc_p l g l e k mbsjc 5 &Rpg_vg_j rcqr'*
Week 10: 14 November - 18 November	Lecture	Slope stability Quiz 3 (weeks 5 to 8 materials) Workshops 8 and 9 *Pcjc_qc md jc_p l g l e k mbsjc 6 &Qjmnc qr_ `gjgrw'*

Resources

Prescribed Resources

The textbook for the course, on which most of the course PowerPoint slides are based and contains thorough explanations and dozens of worked examples, is sold in the UNSW bookshop:

Holtz, R.D., Kovacs, W.D. and Sheahan, T.C. (2011), “An Introduction to Geotechnical Engineering”, Second Edition. International Edition. Pearson.

The following reference books may also be useful for additional reading, many of them can be found in the UNSW library:

- Indraratna, Heitor, and Vinod, “Geotechnical Problems and Solutions - A Practical Perspective”, CRC press, 2020
- Craig, R. F. "Soil Mechanics", CRC press, 2012
- Das, B. M., “Principles of Geotechnical Engineering”, PWS publishing, 1998-2006
- Lambe and Whitman, "Soil Mechanics", Wiley, 1975
- Barnes, G., "Soil Mechanics, Principles and practice", Palgrave MacMillan; 3rd Ed, 2011
- Budhu, M., “Soil Mechanics and Foundations”, Wiley & Sons, 2007
- Smith, I, “Smith’s Element of Soil Mechanics”, Blackwell, 2006

Also, students may find the Soil Mechanics Book by Prof Verruijt in PDF from:

http://geo.verruijt.net/software/SoilMechBook2012.pdf

Course Evaluation and Development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, and informal discussions and feedback throughout the term. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

Laboratory Workshop Information

No in-person laboratory classes this Term due to the laboratory refurbishment.

Submission of Assessment Tasks

Please refer to the Moodle page of the course for further guidance on assessment submission.

UNSW has a standard late submission penalty of:

- 5% per day, for all assessments where a penalty applies, capped at five days (120 hours), after which a student cannot submit an assessment, and no permitted variation.

Academic Honesty and Plagiarism

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person’s work or ideas as if they were your own. When it is necessary or desirable to use other people’s material you should adequately acknowledge whose words or ideas they

Academic Information

Final Examinations:

Final exams in T3 2022 will be held online between 25th November - 8th December 2022 inclusive, and supplementary exams between 9th - 13th January 2023 inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

ACADEMIC ADVICE

- Key Staff to Contact for Academic Advice (log in with your zID and password): https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw
- Key UNSW Dates - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.
- CVEN Student Intranet (log in with your zID and password): https://intranet.civeng.unsw.edu.au/student-intranet
- Student Life at CVEN, including Student Societies: https://www.unsw.edu.au/engineering/civil-and-environmental-engineering/student-life
- Special Consideration: https://student.unsw.edu.au/special-consideration

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering 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	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	
PE3.2 Effective oral and written communication in professional and lay domains	