

School of Civil and Environmental Engineering UNSW Engineering

## **CVEN9741**

**Engineering Construction** 

Term 2, 2023



## **Course Overview**

## **Staff Contact Details**

#### Convenors

Name	Email	Availability	Location	Phone
Robert Holdom	robert.holdom@unsw.edu.au	email or office contact by phone or in person	CE211	+61293857 773

#### Lecturers

Name	Email	Availability	Location	Phone
Robert Holdom	robert.holdom@unsw.edu.au	email or office contact by phone or in person	CE211	+61293857 773

#### **School Contact Information**

<u>Engineering Student Support Services</u> – 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

The discipline of engineering construction covers diverse activities including earthmoving, drilling, tunnelling, blasting, hoisting, conveying, pumping, dewatering, dredging, pile-driving, and concreting. The course explores some latest industry and best practices within these and other construction activities.

## **Course Aims**

The aim of this course is to transfer in-depth knowledge of industry practice regarding construction activities; promote advanced thinking in construction; practice problem solving skills on industry case studies.

## **Course Learning Outcomes**

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

Learning Outcome	EA Stage 1 Competencies
1. Develop an understanding of some of the construction methods and techniques used in civil engineering and other allied profession/ practices for the excavation, handling and moving construction materials	PE1.1, PE1.3, PE2.3, PE2.4
2. Through independent research (which is student-centred and selfdirected learning), a student should be able to identify the key factors, design a solution to such a problem that is environmentally sustainable. That solution is expected to comply within the industry acceptable ethical bounds and social constraints	PE1.1, PE1.2, PE1.4, PE2.3, PE2.4
3. Communicate developed solutions concisely, by presenting their work as a written submission or verbally	PE3.1, PE3.2, PE3.3, PE3.4, PE3.5, PE3.6
4. Complete such work if assigned to a multi-disciplinary team	PE2.2, PE2.3, PE2.4, PE3.1, PE3.2, PE3.4, PE3.5, PE3.6

## **Teaching Strategies**

Lectures: Structured learning content.

Tutorials/workshops: Guided problem solving.

Private study: Review of lecture and tutorial material; library work; additional problem solving.

Assessment: Assignments and examination.

## **Additional Course Information**

This course is designed to develop and extend students knowledge and understanding about civil engineering construction practices. The course will focus upon the construction methods used in civil engineering which includes earthmoving, excavation of rock, and the excavation techniques used in dealing with a high water table such as dredging and site dewatering. Weekly scheduled workshops will provide the opportunity for you to develop your skills across a wide scope of disciplines that are needed for the delivery of Civil Engineering construction projects. The methods used to construct piles and piers, as well as a detailed outline of how materials handling is dealt with on civil engineering construction sites for the movement of concrete and other construction materials is a key focus point of this course and the workshops will provide the opportunity for you to develop your skills in all of these key construction practices. There are no specific prerequisites for this course but it assumes that students commencing this course have either an undergraduate degree in engineering or allied experience in civil construction operations, mining or tunnelling. All communications shall be made using the course Moodle.

## Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Individual Assignment: Site Investigation and Monitoring Report	35%	06/07/2023 05:00 PM	1, 2, 3
2. Group Report/ Discussion Paper	20%	27/07/2023 05:00 PM	1, 2, 3, 4
3. Three (3) in-term Class Tests each valued at 15%	45%	Not Applicable	1, 2, 3

## Assessment 1: Individual Assignment: Site Investigation and Monitoring Report

Assessment length: 3000 words Submission notes: Submit in accordance with the Assignment outline. Due date: 06/07/2023 05:00 PM Marks returned: Within 2 weeks

This assignment allows you to investigate the equipment and construction methodologies used in Civil Engineering and reporting on the current status within industry. The way you present your findings will feature as a significant part of the assessment of this task. The procedures used in producing the Assignment will provide you with the ability and methodology to investigate other construction processes for your construction related roles and employment.

#### Assessment criteria

The criteria of this Assessment Task are detailed in Assessment 1 located in the Moodle.

#### Hurdle requirement

This is a must pass submission requiring a minimum mark of 50% of the available marks allocated for this Assessment Task.

#### **Assessment 2: Group Report/ Discussion Paper**

**Assessment length:** Not to exceed more than 12 pages in accordance with the Assessment Task. outline

**Submission notes:** The group is required to nominate their topic before 19th June for which they will receive 1% of the marks available for this Assignment. The remainder of the marks will be allocated to the grading of the submission as a single pdf made by the group in accordance with the issued instructions for the Group Assignment. Only one student is permitted to upload the Assignment so as to maintain the Turn-it-in integrity,

#### Due date: 27/07/2023 05:00 PM

Marks returned: After the Term finishes. Expect 3 weeks after the submission deadline.

The Discussion Paper is to be structured in Report format.

#### Assessment criteria

The criteria of this Assessment Task are detailed in Assessment 2 located in the Moodle.

#### Hurdle requirement

This is a must pass submission requiring a minimum mark of 50% of the available marks allocated for this Assessment Task.Students in each group wiil receive the same mark.

#### Assessment 3: Three (3) in-term Class Tests each valued at 15%

**Submission notes:** The course has been structured along particular topics that form the basis of each Class Test. Students will complete each test in person at the appointed venue. **Marks returned:** Within two weeks of each Class Test sitting

The three (3) Class Tests total 45%. All students are required to sit each of the three (3) Class Tests which will be of equal weighting, valued at 15% each. Each Test will be of 75 minutes duration and students will complete their answers by their handscript on the test paper.

The grouping of the topics that will be taught and examined in each Class Test is as follows:

Class Test 1 will examine the content of lecture and workshop material covered in Weeks 1, 2, & 3.

Class Test 2 will examine the content of lecture and workshop material covered in Weeks 4, 5, & 7.

Class Test 3 will examine the content of lecture and workshop material covered in Weeks 8, 9, & 10.

#### Assessment criteria

In addition to making Assignment submissions a student must sit each of the three (3) Class Tests.

#### Hurdle requirement

A student is required to obtain at least 50% of the marks available for the Class Test section of the course. Students do not have to gain a 50% pass in each Class Test in obtaining their overall Class Test total mark.

#### Additional details

Students will be required to be at the Class Test venue at least 20 minutes before the test commencement. You will produce your UNSW Student Identity Card before being admitted into the venue.

Class Test 1 will be held on Saturday 24th June, 2023, commencing at 10:00am.

Class Test 2 will be held on Saturday 15th July, 2023, commencing at 10:00am.

Class Test 3 will be held on Saturday 5th August, 2023, commencing at 10:00am.

## **Attendance Requirements**

Students are strongly encouraged to attend all classes and review lecture recordings.

## **Course Schedule**

All Lectures and Workshops will be ordinarily be presented by Mr Robert Holdom and students will be advised of changes to this expectancy.

The weekly Lecture and Workshop will be an integrated evening program. The weekly allocated time (18:00 – 21:00h) will be recorded as a 'Lecture' and made available on the course Moodle should you want to review any content [using the 'Echo360' recording system]. The Week 1 Lecture uploading may take several days for it to be made available on the Moodle, but beyond that, the weekly lecture recordings are normally expected to be available on the course Moodle within 24 hours.

An additional 1 hour each week will be allocated for students to meet with the lecturer to discuss their learning. There will be provision made by way of a Moodle Discussion board for this course plus any additional weekly times required for students to contact the lecturer. This will be finalised in Week 1.

#### View class timetable

#### Timetable

Date	Туре	Content
O-Week: 22 May - 26 May		
Week 1: 29 May - 2	Lecture	Site Investigation and Consruction planning
June	Workshop	Outline of Assignments
		Planning of Site Meetings
		Dealing with subsoil ground conditions
Week 2: 5 June - 9	Lecture	Rock removal - Blasting and drilling
June	Workshop	Blasting calculations
		Detonation methods
Week 3: 12 June - 16 June	Lecture	King's Birthday Public Holiday on Monday 12 June 2023. <i>No Class</i>
		Recorded Lecture and Workshop.
		Pile driving operations: Pile driving operations - Timber, Steel and Concrete piles and Splicing of Piles
	Workshop	King's Birthday Public Holiday on Monday 12

		June 2023. No Class
		Recorded Lecture and Workshop.
		Learning from the recorded Lecture/ Workshop
Week 4: 19 June - 23	Lecture	Earthmoving and equipment selection
June	Workshop	Accessing Australian Standards through UNSW Library
		'Caterpillar' Handbook
		Equipment selection
		Assessment Task 2 - part 1 due
		Class Test 1 on Saturday
Week 5: 26 June - 30	Lecture	Dredging and dewatering
June	Workshop	Dredging operations calculations
Week 6: 3 July - 7 July		Flexibility Week for all courses (non-teaching). No Class.
		Assessment Task 1 due
	Assessment	Individual Assignment: Site Investigation and Monitoring Report: Submit in accordance with the Assignment outline.
Week 7: 10 July - 14	Lecture	Concreting - Planning and equipment selection
July	Workshop	Methods of design and placing concrete
		Class Test 2 on Saturday
Week 8: 17 July - 21	Lecture	Concreting - Construction techniques
July		Compressed Air systems
	Workshop	Pump-placed concrete
		Tremmie-tube placed concrete
		Compressed air system design
Week 9: 24 July - 28	Lecture	Materials handling operations
July	Workshop	Equipment selection in civil construction operations
		Design of material handling operations

		Assessment Task 2 - part 2 due
	Assessment	Group Report/ Discussion Paper: The group is required to nominate their topic before 19th June for which they will receive 1% of the marks available for this Assignment. The remainder of the marks will be allocated to the grading of the submission as a single pdf made by the group in accordance with the issued instructions for the Group Assignment. Only one student is permitted to upload the Assignment so as to maintain the Turn-it-in integrity,
Week 10: 31 July - 4	Lecture	Integrated construction operations
August	Workshop	Planning for integrated construction operations
		Revision and Course Review
		Class Test 3 on Saturday

## Resources

#### **Prescribed Resources**

The Moodle will provide you with the initial readings for each week.

#### **Recommended Resources**

Students will be advised during the Lecture and Workshop sessions of additional readings. As postgraduate students, it is expected that students will research and read widely on the course topics.

#### **Course Evaluation and Development**

The course will be evaluated formally using the myExperience reporting tool. Student discussion with the lecturer throughout the term as wall as review of the assessment elements will form part of the course review process. That said, all students are encouraged take the time throughout the term to meet and discuss their learning progress with the lecturer.

#### Laboratory Workshop Information

Whilst the Lecture and Workshop session each week are the formal class meeting times, an additional weekly session of 1 hour is allocted for students to discuss their progress, learning issues and their understanding of the weekly topics.

## **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 are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

https://student.unsw.edu.au/plagiarism

## **Academic Information**

#### **Final Examinations:**

Final Exams in T2 2023 will be held on campus between Friday 11th and Thursday 24th August (inclusive), and Supplementary Exams between Monday 4th and Friday 8th September (inclusive). You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

For students enrolled in the distance offering of a postgraduate course, and who reside further than 100km from UNSW Kensington campus, will be contacted regarding sitting an external exam. The school's External Exam Policy can be found on the Intranet.

#### ACADEMIC ADVICE

- Key Staff to Contact for Academic Advice (log in with your zID and password): <u>https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw</u>
- <u>Key UNSW Dates</u> 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): <u>https://intranet.civeng.unsw.edu.au/student-intranet</u>
- Student Life at CVEN, including Student Societies: <u>https://www.unsw.edu.au/engineering/civil-and-environmental-engineering/student-life</u>
- Special Consideration: https://student.unsw.edu.au/special-consideration
- General and Program-Specific Questions: <u>The Nucleus: Student Hub</u>
- Book an Academic Advising session: https://unswengacademicadvising.as.me/schedule.php

## Disclaimer

This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up to date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.

#### **Image Credit**

Mike Gal.

#### CRICOS

CRICOS Provider Code: 00098G

#### Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

# 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	1
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	1
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	1
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	
PE3.3 Creative, innovative and pro-active demeanour	✓
PE3.4 Professional use and management of information	1
PE3.5 Orderly management of self, and professional conduct	✓
PE3.6 Effective team membership and team leadership	1