

CVEN9741 ENGINEERING CONSTRUCTION

COURSE DETAILS

Units of Credit	6	
Contact hours	4 hours per week	
Class	Monday, 18:00 – 20:00	Multimodal in-class and online UNSW Business School – Room 115
Workshop	Monday, 20:00 – 21:00	Multimodal in-class and online UNSW Business School – Room 115
	Other: TBA, 1 hour online	online
Course Coordinator and Lecturer	Mr Robert Holdom email: robert.holdom@unsw.edu.au office: CE211 phone: 02 9385 7773	

INFORMATION ABOUT THE COURSE

This course is designed to develop and extend your 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. 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 to 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.

HANDBOOK DESCRIPTION

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.

<https://www.handbook.unsw.edu.au/postgraduate/courses/2021/CVEN9741/>

OBJECTIVES

The objectives of the course are to:

- Provide a detailed outline on specific construction methods and techniques employed in excavating, handling and moving construction materials for their use or disposal on a civil engineering construction site;
- Identifying the key factors that need to be addressed in each construction process; and,
- Investigate state-of-the-art practices and techniques presently being employed in industry;
- Develop construction solutions that are environmentally sustainable and ethically and socially responsible.

In addition the course aims to foster:

- Capacity for analytical thinking and for creative problem solving;
- Ability to engage independent and reflective learning;
- Develop the skills for collaborative and multi-disciplinary work by working effectively in small teams;
- Information literacy; and,
- Skills for effective communication.

These objectives and course aims will be achieved using:

- Lectures and assigned readings;
- Workshops; and,
- Assessment Tasks (which includes a Final Examination)

List of programme attributes:

- An in-depth engagement with the relevant disciplinary knowledge in its inter-disciplinary context
- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning
- Information literacy
- Skills for collaborative and multi-disciplinary work
- A respect for ethical practice and social responsibility
- Skills for effective communication

TEACHING STRATEGIES

This course will be presented as a series of lectures, each accompanied by additional reading material. Following each lecture, a workshop will be conducted for you to practice implementation of key knowledge acquired from the lecture.

In Term 2, 2021 the CVEN9741 course will be delivered in three × (3-week) sessions. These separate sessions will each have a separate Class Test that will be conducted throughout the term on the Saturday of the Weeks: 3, 7 & 10.

Specific teaching and learning strategies include:

Private Study	<ul style="list-style-type: none">• Download materials from UNSW Moodle• Review lecture material and additional reading• Complete all assignments• Do the set class problems• Join Moodle discussions of problems
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	<ul style="list-style-type: none"> • Reflect on class problems and assignments • Keep up with notices and find out marks via Moodle
Lectures	<ul style="list-style-type: none"> • Find out what you must learn • Summarise essential course material from lectures and associated reading • Follow worked examples • Hear announcements on course changes
Workshops	<ul style="list-style-type: none"> • Be guided by Demonstrators • Practice solving set problems • Ask and answer questions
Assessments	<ul style="list-style-type: none"> • Enhance your knowledge by undertaking necessary research to complete given tasks • Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving • Do not copy sections from textbooks or websites, always use appropriate references for sourced material • In preparing an assessment element pay particular attention to the instructional advice provided by the lecturer to maximise your mark

EXPECTED LEARNING OUTCOMES

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

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

Learning Outcome	EA Stage 1 Competencies
1. <i>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</i>	<i>PE1.1, PE1.3, PE2.3, PE2.4</i>
2. <i>Through independent research (which is student-centred and self-directed 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</i>	<i>PE1.1, PE1.2, PE1.4, PE2.3, PE2.4</i>
3. <i>Communicate developed solutions concisely, by presenting their work as a written submission or verbally</i>	<i>PE3.1, PE3.2, PE3.3, PE3.4, PE3.5, PE3.6</i>
4. <i>Complete such work if assigned to a multi-disciplinary team</i>	<i>PE2.2, PE2.3, PE2.4, PE3.1, PE3.2, PE3.4, PE3.5, PE3.6</i>

For each hour of contact it is expected that you will put in at least 1.5 hours of private study.

COURSE PROGRAM

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. 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.

Term 2, 2021

Date	Topic and Lecture Content	Demonstration Content
31/05/2021 (Week 1)	Site Investigation and Construction planning	Outline of Assignments Planning of Site Meetings Dealing with subsoil ground conditions
07/06/2021 (Week 2)	Rock removal – Blasting, drilling	Blasting calculations Detonation methods
14/06/2021 (Week 3)	Queen's Birthday Public Holiday on Monday 14th June, 2021. No class. Recorded lecture: Timber, Steel and Concrete Piles/ Splicing of Piles	No class. Learning from recorded lecture Class Test 1 on Saturday
21/06/2021 (Week 4)	Earthmoving and equipment selection	Accessing Australian Standards through UNSW Library 'Caterpillar' Handbook Equipment selection Assessment Task 2 - part 1 due
28/06/2021 (Week 5)	Dredging and dewatering Pile driving operations	Dredging operations calculations Learning from recorded lecture
05/07/2021 (Week 6)	Flexibility week for all courses (non-teaching) No class.	No class. Assessment Task 1 due
12/07/2021 (Week 7)	Concreting – Planning and equipment selection	Methods and design of placing concrete Class Test 2 on Saturday
19/07/2021 (Week 8)	Concreting – Construction techniques Compressed Air systems – Design and use	Pump-placed concrete Tremmie-tube placed concrete Compressed air system design
26/07/2021 (Week 9)	Materials handling operations	Equipment selection in civil construction operations Design of material handling operations Assessment Task 2 - part 2 due
03/08/2021 (Week 10)	Integrated construction operations	Learning from recorded lecture Revision & Course Review Class Test 3 on Saturday

ASSESSMENT

There will be NO formal examination for CVEN9741 Engineering Construction. Instead, the final mark and grade for this course will be determined based on the aggregated scores from each of the following assessment tasks.

Assessment Task 1 (individual submission) – Equipment/ Construction Method (30%) – due Week 6

Assessment Task 2 (individual submission) – Group Discussion Paper (25%) – due Week 9

Assessment Task 3 (three Class Tests) – (at 15% each) – to be held on Saturday of Weeks: 3, 7 & 10

Your Final Mark for CVEN9741 Engineering Construction will be the aggregated total of all above assessment tasks. The Final Grade for CVEN9741 Engineering Construction is as per the university's Mark/Grade scale.

You should be mindful that your Assignment submissions are documents that you can take to interview is seeking future employment. Therefore you should be very mindful of the layout and content you submit as it has application for you beyond the course delivery.

Students who perform poorly in any of the Assessment Tasks outlined in the Assessment Overview are recommended to discuss their progress with the Lecturer at the first available opportunity (within a week) during the term on receipt of that poor performance.

1. Individual Assignment – due Week 6 Value 30%

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.

2. Group Discussion Paper – due Week 9 Value 25%

The Group Discussion Paper will be conducted in groups of three students. Each group will nominate their topic preferences for approval. The basis of this work is to provide each learner the opportunity to work with others, to a specific deadline.

3. Class Tests

The course has been structured along particular topics that form the basis of each Class Test, viz:

- a. Site Investigation and Construction planning, Rock removal – Blasting, drilling, Timber, Steel and Concrete Piles/ Splicing of Piles.
- b. Earthmoving and equipment selection, Dredging and dewatering, Pile driving operations, Concreting – Planning and equipment selection.
- c. Concreting – Construction techniques, Compressed Air systems – Design and use, Materials handling operations, Integrated construction operations.

The grouping of these topics will be taught and examined by way of separate Class Tests:

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.

Class Test 1 will be held on Saturday 19th June, 2021.

Class Test 2 will be held on Saturday 17th July, 2021.

Class Test 3 will be held on Saturday 7th August, 2021.

All Class Tests will be conducted as 'open-book' examinations, be completed individually from a student's home as an online test and will be of 75 minutes nominal duration.

Learning and assessing in this manner will require students to summarise their work on a weekly basis, complete the workshop material tasks and seek out the assistance they need by way of discussing it with other peers, or the Lecturer, and/ or, asking questions on the Moodle Discussion Board.

All assignments are to be submitted by uploading onto the Moodle. Your submissions may be subject to a 'Turnitin' submission tool review. All Class Tests are to be submitted by uploading onto the Moodle. Each Class Test will be issued with particular instructions.

[Note: The lecturer reserves the right to adjust the final scores by scaling if agreed by the Head of School.]

Whilst not applicable to students completing CVEN9741 Engineering Construction, please note: Supplementary Examinations for Term 2, 2021 will be held between Monday 6th September 2021 and Friday 10th September 2021, should you be required to sit one. You are required to be available during these dates. Please do not make any personal or travel arrangements during this period.

PENALTIES

Late submissions will receive a 10% deduction penalty per day. Late submissions up to 5 days late will be marked and will receive the appropriate penalty deductions. Any submissions made that are more than 5 days late will not be accepted for marking.

ASSESSMENT OVERVIEW

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
1. Individual Assignment							
1. Individual Assignment	3000 words Presented in 'Report' format	30%	1, 2, 3	Students are required to identify a Civil Engineering Construction operation and report on its progress over at least 4 weeks. Over the duration you are to pick a particular civil engineering construction task and determine the production rate for the task. Both content and a student's written presentation will be assessed.	Uploaded onto the Moodle before 5pm on 8 th July 2021	After 5pm on 13 th July 2021	Within 2 weeks
2. Individual Assignment							
3. Group Discussion Paper	Discussion Paper (12 pages)		1, 2, 3 & 4	The Discussion Paper is to be structured in 'Report' format and uploaded into the Moodle Portal by ONE GROUP MEMBER ONLY.			
a. Part 1 - Forming Group before end of topic approval given before end of Week 4		1%		Groups who have submitted their topic choices before 5pm on Thursday 24 th June, 2021 will receive the 1% for their early engagement. Otherwise no mark for students who have not finalised their Group topic nominations.	Before 5pm on 24 th June 2021		Automatic
b. Part 2 - Submission		19%		Final Submission	Uploaded onto the Moodle before 5pm on 29 th July 2021	After 5pm on 3 rd August 2021	After release of Term 2 results

3.Class Tests							
Class Test 1	75 mins	15%	1, 2 & 3	Content covered in Weeks 1, 2, & 3 Students will be required to provide answers by way of any of the following forms: calculations, or, written answers, or, select an answer to a question from choice options	Saturday 19 th June 2021 online 10:00 – 11:15am plus reading & uploading time	Not sitting event	Within 2 weeks
Class Test 2	75 mins	15%	1, 2 & 3	Content covered in Weeks 4, 5, & 7 Students will be required to provide answers by way of any of the following forms: calculations, or, written answers, or, select an answer to a question from choice options	Saturday 17 th July 2021 online 10:00 – 11:15am plus reading & uploading time	Not sitting event	Within 2 weeks
Class Test 3	75 mins	15%	1, 2 & 3	Content covered in Weeks 8, 9, & 10 Students will be required to provide answers by way of any of the following forms: calculations, or, written answers, or, select an answer to a question from choice options	Saturday 7 th August 2021 online 10:00 – 11:15am plus reading & uploading time	Not sitting event	Within 2 weeks

RELEVANT RESOURCES

There are no prescribed texts for CVEN9741.

The lecturer will provide you with prescribed weekly readings for the each lecture topic and:

- You are required to conduct your own Literature Research in completing the assessment elements of CVEN9741 Engineering Construction. This should be discussed with the UNSW library staff as to how you can undertake independent research and find your resources.
- Independently seek new material by reviewing suggested additional readings and availability (in bookshop, UNSW Library, Open Reserve).
- Additional materials provided on Moodle.
- Recommended Internet sites.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

<https://student.unsw.edu.au/dates>

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 ADVICE

For information about:

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

Refer to Key Contacts on the Faculty website available at:

<https://www.unsw.edu.au/engineering/student-life/student-resources/key-contacts>

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	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
PE2: Engineering Application Ability	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 Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (professional and lay domains)
	PE3.3 Creative, innovative and pro-active demeanour
	PE3.4 Professional use and management of information
	PE3.5 Orderly management of self, and professional conduct
	PE3.6 Effective team membership and team leadership