



School of Civil and Environmental Engineering

Term 3, 2021

CVEN9723 -

DESIGN OF CONSTRUCTION OPERATIONS

COURSE DETAILS

Units of Credit	6
Contact hours	4 hours per week
Class	Wednesday, 14:00 - 18:00 (Weeks 1-5, 7-10) Online Teaching
Course Coordinator and Lecturer	Dr X Shen email: x.shen@unsw.edu.au office: Civil Engineering 212 (K-H20-212)

COURSE COMMUNICATIONS

All communications on the course are to be through the Moodle's "Questions" section, or during the nominated lecture/workshop time slots. Using the Moodle discussion tool allows all students to see replies to any questions asked, and allows all students to join the discussions. Also use the Moodle discussion tool to create discussion topics with others in the class.

INFORMATION ABOUT THE COURSE

The course is designed to extend your knowledge on engineering design and planning of construction operations. It covers fundamental construction methods and design practices for a variety of construction processes, including heavy civil construction, building construction and tunnel and utility pipeline construction. Examples will be given to guide the students in planning and directing construction operations.

EXCLUDED COURSE

Students should not undertake the course if they have completed the equivalent undergraduate course:

- CVEN4102 – Operations and Projects

HANDBOOK DESCRIPTION

See link to virtual handbook:

<http://www.handbook.unsw.edu.au/postgraduate/courses/2021/CVEN9723.html>

OBJECTIVES

The objectives of this course are to:

- Understand a variety of construction methods and processes;
- Identify the key factors adopted in the design of permanent and temporary structures;
- Work independently for individual assignments;
- Investigate the state-of-the-art in construction technologies and operations.

TEACHING STRATEGIES	
Private Study	<ul style="list-style-type: none"> • Review lecture material and textbook • Do set problems and assignments • Join Moodle discussions of problems • Reflect on class problems and assignments • Download materials from Moodle • Keep up with notices and find out marks via Moodle
Lectures	<ul style="list-style-type: none"> • Find out what you must learn • Follow worked examples • Hear announcements on course changes • Practice solving set problems • Ask questions
Assessments	<ul style="list-style-type: none"> • Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving

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>Explain the process of construction operations</i>	<i>PE1.1, PE3.2, PE3.6</i>
2. <i>Work independently on the design a permanent or temporary structure</i>	<i>PE1.5, PE2.1, PE2.2</i>
3. <i>Select a suitable method for constructing underground tunnels</i>	<i>PE1.6, PE2.2, PE2.3</i>

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

COURSE PROGRAM**TERM 3 2021**

Date	Topic	Lecture Content	Assessment Due
15/09/2021 (Week 1)	Earthwork Planning	<ul style="list-style-type: none">• Earthmoving• Quantity take-off	
22/09/2021 (Week 2)	Shoring Design	<ul style="list-style-type: none">• Shoring systems• Shoring design	
29/09/2021 (Week 3)	Lifting Design	<ul style="list-style-type: none">• Crane types• Lifting design	Individual Assignment 1
06/10/2021 (Week 4)	Tunnelling Construction	<ul style="list-style-type: none">• Tunnelling methods• Production and cost	
13/10/2021 (Week 5)	Trenchless Techniques	<ul style="list-style-type: none">• Trenchless methods	Midterm Exam
20/10/2021 (Week 6)		<i>Flexibility week for all courses (non-teaching)</i>	
27/10/2021 (Week 7)	Piling Design	<ul style="list-style-type: none">• Construction piles• Piling design	
03/11/2021 (Week 8)	Formwork Design	<ul style="list-style-type: none">• Formwork systems• Formwork design	
10/11/2021 (Week 9)	Cost Estimation	<ul style="list-style-type: none">• Cost Estimation	Individual Assignment 2
17/11/2021 (Week 10)	Construction Safety and Quality Management	<ul style="list-style-type: none">• Construction Safety and Quality Management	

ASSESSMENT

Assessment for the course comprises of one midterm exam, two individual assignments and one final exam.

- The midterm exam will assess the basic knowledge covered in the main topics of the course. Students who perform poorly in the exam will have a chance to discuss progress with the lecturer during the term. The exam will be of an hour duration. It consists of both quantitative and theoretical questions.
- The purpose of the individual assignments is to work independently on the engineering design of construction operations. Students can reflect and apply what they have learnt from the course by solving practical and open-ended engineering problems.
- The final exam provides an opportunity to assess higher capabilities in understanding and applying the knowledge learned throughout the term. It will be of two hours duration in the formal exam period.

The final grade for this course will normally be based on the sum of the scores from each of the assessment tasks. The Final Examination is worth 50% of the Final Mark if class work is included and 100% if class work

is not included. The class work is worth 50% of the Final Mark if included. A mark of at least 40% in the final examination is required before the class work (hand-in quizzes and individual tasks) is included in the final mark. The formal exam scripts will not be returned but you are permitted to view the marked script.

Students who perform poorly in the midterm exam are recommended to discuss progress with the lecturer during the term. There will be hand-in problems and quick quiz. Note: The lecturer reserves the right to adjust the final scores by scaling if agreed by the Head of School.

Details of each assessment component, the marks assigned to it, the criteria by which marks will be assigned, and the dates of submission are set out below.

Supplementary Examinations for Term 3 2021 will be held on Monday 10 January – Friday 14 January 2022 (inclusive) should you be required to sit one. You are required to be available during these dates. Please do not to make any personal or travel arrangements during this period.

PENALTIES

Submit the individual assignments in softcopy only via the Moodle by 17:00 of the specified due date. After submitting, always check what you have submitted. Late work will be penalised at the rate of 20% of the total mark per calendar day after the due time and date have expired.

ASSESSMENT OVERVIEW

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria <i>(this needs to explicitly describe what students are expected to demonstrate in the task)</i>	Due date and submission requirements	Deadline for absolute fail	Marks returned
1. Midterm exam							
Midterm exam	1 hour	25%	L1, L2	Understand basic knowledge covered in the main topics and work independently for the engineering design	13/10/2021 (Week 5)	/	27/10/2021 (Week 7)
2. Individual Assessments							
Assignment 1	1 week	5%	L1, L2	work independently on the engineering design of construction operations	28/09/2021 (Week 3)	/	08/10/2021 (Week 4)
Assignment 2	4 weeks	20%	L1, L2		09/11/2021 (Week 9)	/	23/11/2021 (Week 11)
3. Final Exam							
Final Exam	2 hours	50%	L1, L2, L3	Demonstrate higher capabilities in understanding and applying the knowledge learned throughout the term	Normal exam period	/	Normal date for release of exam results

RELEVANT RESOURCES

- Textbook details, including title, author(s), publisher, edition, year of publication, ISBN and availability (in bookshop, UNSW Library, Open Reserve).
- List of required and 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

Useful information and resources:

- 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>
- 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>
- General and Program-Specific Questions: [The Nucleus: Student Hub](#)

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