



## School of Civil and Environmental Engineering

Term 2, 2020

# CVEN9744 CIVIL ENGINEERING PRACTICES

### COURSE DETAILS

<b>Units of Credit</b>	6	
<b>Contact hours</b>	4 hours per week	
<b>Class</b>	Thursday, 17:00 – 19:00	online
<b>Workshop</b>	Thursday, 19:00 – 20:00	online
	TBA, 1 hour total online	online
<b>Course Coordinator and Lecturer</b>	Robert Holdom	
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	office: CE 211	
	phone: 02 9385 7773	

### INFORMATION ABOUT THE COURSE

This course's focus is upon the management of Civil Engineering projects in terms of contract selection, equipment and labour productivity issues and how construction safety and risk is managed over the wide spectrum of work that civil engineering construction encompasses.

The course has been designed upon several broad themes:

Firstly, the contract types used in civil engineering and factors influencing their selection.

Secondly, methods of determining construction productivity and how this factor is a significant driver causing change to civil engineering construction practices.

Thirdly, the practicalities of how equipment purchasing is made, taking into consideration the initial capital purchase and its depreciation, the cost of operation, and how changed labour methods and equipment productivity impacts upon the equipment purchasing decision.

The final topic that will be covered relates to construction safety and the management of risk in civil construction operations.

The weekly scheduled workshop questions will provide the opportunity for you to develop your skills across these topics which are all required in the delivery of civil engineering projects. There are no specific prerequisites for this course but it is assumed that students commencing this course have either an undergraduate degree in engineering or allied experience in civil construction operations. All communications shall be made using the course Moodle.

## HANDBOOK DESCRIPTION

Civil engineers deal daily with materials, equipment, people, money and contracts. How these are managed determines the success or otherwise of engineering ventures. Equipment purchases, depreciation and operation, equipment and labour productivity, safety, risk and quality amongst other considerations need close scrutiny. The course looks at such civil engineering focuses, aimed at producing successful projects.

<https://www.handbook.unsw.edu.au/postgraduate/courses/2020/CVEN9744/>

## OBJECTIVES

The objectives of the course are to:

- Provide the student with an understanding about the practices that need to be completed in developing contracts, selecting equipment and how management of risk and safety issues are dealt with, in planning and in practice;
- To broaden a student's knowledge and understanding of how the course topics impact upon the civil engineering planning and construction phases;
- Investigate state-of-the-art practices and techniques presently being employed in industry; and,
- Develop their professional civil engineering understanding in selecting practices that are ethically sound and sociably 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 and Class Tests

## 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, 2020 the CVEN9744 course will be delivered in three x (3-week) sessions. These sessions will be separately assessed throughout the term in Weeks 5, 8 & 11.

Specific teaching and learning strategies include:

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

*All course reading materials, course communications, student questions, Assignment and Report submissions, uploading completed Class Tests throughout the term, Assignment and Report grades (including feedback) will be made using the course Moodle.*

#### 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.	a. Develop an understanding of the factors impacting the selection of the different contract types that may be used in Civil Engineering b. Apply some of the processes and techniques that are used in the evaluating construction equipment selection and construction economics c. The methods used to evaluate construction productivity and its impact on project viability d. An overview of construction safety and risk management issues that are applicable to Civil Engineering operations and projects	PE1.1, PE1.2, PE1.3, PE1.6, PE2.1, PE2.2, PE2.3, PE2.4
2.	Through independent research, (which is student-centred and self-directed learning), a student should be able to identify the construction practices required of an infrastructure project and be able to acquire the knowledge to enable them be able to contribute within a multi-disciplinary infrastructure team	PE1.1, PE1.2, PE1.4, PE2.1, PE2.3, PE2.4
3.	Communicate developed solutions concisely, by presenting their work as a written submission or verbally	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, PE3.3, PE3.4, PE3.5, PE3.6

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

<b>COURSE PROGRAM</b>
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**Term 2, 2020**

<b>Date</b>	<b>Topic and Lecture Content</b>	<b>Demonstration Content</b>
04/06/2020 (Week 1)	Introduction to civil engineering practices	Weekly Workshop on topic
11/06/2020 (Week 2)	Equipment purchasing & construction economics Part 1	Weekly Workshop on topic
18/06/2020 (Week 3)	Contracts used in civil engineering practices Factors that impact on contract selection	Weekly Workshop on topic
25/06/2020 (Week 4)	Equipment purchasing & construction economics Part 2	Weekly Workshop on topic <b>Class Test 1 on Saturday</b>
02/07/2020 (Week 5)	Factors that impact on capital spending	Weekly Workshop on topic
09/07/2020 (Week 6)	<b><i>Flexibility week for all courses (non-teaching)</i></b> <b><i>No class.</i></b>	<b><i>No class.</i></b>
16/07/2020 (Week 7)	Construction safety and risk management Part 1	Weekly Workshop on topic
23/07/2020 (Week 8)	Internal Rate of Return (!RR) Analysis	Weekly Workshop on topic <b>Class Test 2 on Saturday</b>
30/07/2020 (Week 9)	Construction safety and risk management Part 2	Weekly Workshop on topic
06/08/2020 (Week 10)	Course Review	Weekly Workshop on topic <b>Class Test 3 on Thursday</b>

<b>ASSESSMENT</b>
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There will be NO formal examination for CVEN9744. Instead, the final mark and grade for this course will be determined based on the aggregated scores from each of the three (3) assessment tasks.

1. Individual Assignment

Each student is required to complete an essay on two different contract types that are used in engineering. The way you present your findings will feature as a significant part of the assessment of this task. The successful completion of this Assignment will provide you with the ability to be able to investigate the methods and processes that can be used in future construction work that you will be associated with as your engineering professional career evolves.

2. Group Report

You are required to work in groups of three students and to produce a Group Report from one of the nominated topics. After reading the assessment requirement, each group will nominate their topic preferences for approval. Student groups will be advised of their approved topic and can then commence preparing their submission from that notification. In preparing this work, students will have the opportunity to learn about why different forms of construction methods, processes and

construction solutions were taken and the impacts that those decisions have had in the construction delivery of these pieces of significant infrastructure and its impact on community at large. The basis of this work is to provide each learner the opportunity to work with others, to offer an exchange of ideas among the group and contribute in preparing a group report.

### 3. Class Tests

The course has been structured along particular topic structures:

- a. Construction Economics and Contracts
- b. Equipment Purchasing, Capital Spending and Construction Safety
- c. Internal Rate of Return Analysis, Construction Safety and Risk Management

The grouping of these topics will be taught and examined in a three week period. Each three week period will have a separate Class Test which are:

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 27<sup>th</sup> June, 2020

Class Test 2 will be held on Saturday 25<sup>th</sup> July, 2020

Class Test 3 will be held on Thursday 6<sup>th</sup> August, 2020.

All Class Tests will be conducted as 'open-book' examinations, and conducted 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 and tasks and seek out the assistance they need by way of discussing it with other peers, and asking questions on the Moodle Discussion Board.

*All assignments are to be submitted by uploading onto the Moodle. All submissions shall be subject to a 'Turnitin' submission tool review. No emailed assignment submissions will be accepted.*

*[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 CVEN9744, please note: Supplementary Examinations for Term 2, 2020 will be held between Monday 7<sup>th</sup> September 2020 – Friday 11<sup>th</sup> September 2020 (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**

*All assignments and reports are to be submitted by using the 'Turnitin' submission tool. All assignments and reports are to be submitted uploading onto the Moodle. No emailed copies will be accepted. 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 that are more than 5 days late will not be accepted for marking.*

**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
<b>1. Individual Assignment</b>							
Individual Assignment	2500 word Essay	30%	1	Each student is required to prepare an individual submission in essay form in accordance with the guidelines provided within the assignment outline. Marks will be allocated on content, format of the submitted document, its readability and referencing	Before 5pm on 12 <sup>th</sup> July, 2020	Before 5pm on 17 <sup>th</sup> July, 2020	Within 2 weeks
<b>2. Class Tests</b>							
Class Test 1	75 mins	15%	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 multiple-choice options	Saturday 27 <sup>th</sup> June, 2020 online 10:00 – 11:15am	Not sitting event	Within 2 weeks
Class Test 2	75 mins	15%	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 multiple-choice options	Saturday 25 <sup>th</sup> July, 2020 online 10:00 – 11:15am	Not sitting event	Within 2 weeks
Class Test 3	TBA mins	15%	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 multiple-choice options	Thursday 6 <sup>th</sup> August, 2020 online Commencing at 5:00pm	Not sitting event	Within 2 weeks

3. Group Submission							
a. Topic Approval		2%	2	Students to form a group of three and nominate their topics and have it approved	Before 5pm on 25 <sup>th</sup> June, 2020	Not meeting deadline	Within 1 week
b. Final Submission	4500 word Report	23%	2	A Group Report is to be submitted	Before 5pm on 2 <sup>nd</sup> August, 2020	Before 5pm on 7 <sup>th</sup> August, 2020	Within 2 weeks

## 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

For information about:

- Notes on assessments and plagiarism;
- Special Considerations: [student.unsw.edu.au/special-consideration](https://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 Academic Advice on the School website available at:

<https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice>



## 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
<b>PE3: Professional and Personal Attributes</b>	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