School of Civil and Environmental Engineering

Term 3, 2021

CVEN3101 ENGINEERING OPERATIONS AND CONTROL

COURSE DETAILS

Units of Credit	6		
Contact hours	6 hours per week		
Lecture	Mon,	10:00 – 12:00	Online
	Wed,	13:00 – 15:00	Online
Workshop	Thu,	14:00 – 16:00 (6413)	Online
	Thu,	14:00 – 16:00 (6414)	Online
	Thu,	14:00 – 16:00 (6415)	Online
	Thu,	16:00 – 18:00 (6417)	Online
	Thu,	16:00 – 18:00 (6418)	Online
	Fri,	11:00 – 13:00 (6407)	Online
	Fri,	11:00 – 13:00 (6408)	Online
	Fri,	11:00 – 13:00 (6409)	Online
	Fri,	14:00 – 16:00 (6410)	Online
	Fri,	16:00 – 18:00 (6411)	Online

Course Coordinator and Lecturer

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Lecturer

Dr. Khalegh Barati

Dr. Johnson Shen

Mr. Robert Holdom

INFORMATION ABOUT THE COURSE

This course is an introduction to general principles of construction organisation and control of engineering operations. It starts by looking at cost estimation, safety issues, and quality management in construction projects. This course also addresses project management concepts including PMBOK review, management tools, project scheduling and resource planning. Additional issues considered in the course include important engineering economic, contract management, and risk management topics. Finally, the course covers engineering ethics and its principles in construction industry.

HANDBOOK DESCRIPTION

See link to virtual handbook:

https://www.handbook.unsw.edu.au/undergraduate/courses/2021/CVEN3101

OBJECTIVES

The aim of this course is to provide and introduction to engineering operations and to develop the understanding of the importance and application of these functions to the successful delivery of construction projects. The course achieves this through a combination of lecture presentations, workshops and assessment exercises that are designed to introduce students the general management and engineering principles and enable them to critically reflect on how these principles are employed in the real world. Upon completion of this subject, students are expected to be able to:

- Define the scope of construction engineering and management operations
- Appreciate the key aspects of project management including time, cost, safety, and quality
- Identify and explain key theories and concepts of project management and planning based of PMBOK standard
- Use project management tools such as Gantt chart and CPM charts
- Understand the elements of engineering economics and risk management
- Understand the role and significance of ethics in engineering professionalism
- Explain different types of project delivery systems and contracts

TEACHING STRATEGIES

The teaching strategies that will be used and their rationale. Give some suggested approaches to learning in the course.

Private Study	• 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	• Find out what you must learn • See methods that are not in the textbook • Follow worked examples • Hear announcements on course changes
Workshops	• Be guided by Demonstrators • Practice solving set problems • Ask questions
Assessments	• Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving
Laboratory Work	• Hands-on work, to set studies in context

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.	Define the scope of construction engineering and management operations	PE1.3, PE1.5, PE2.1, PE2.2
2.	Use project management tools such as Gantt chart and CPM charts	PE1.1, PE1.3, PE2.4, PE3.4
3.	Appreciate the key aspects in construction operations including time, cost, safety, and quality	PE1.2, PE2.3, PE2.4, PE3.4
4.	Understand the elements of engineering economics and risk management	PE1.3, PE1.6, PE2.3, PE3.4
5.	Identify and explain key theories and concepts of project management and planning based of PMBOK standard	PE1.1, PE1.3, PE2.1, PE2.4
6.	Understand the role and significance of ethics in engineering professionalism	PE3.1
7.	Explain different types of project delivery systems and contracts	

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 and Lecture Content	Workshop Content	Lecturer	Assessment Due
14/09/2020 (Week 1)	Course Introduction/ Cost Estimation 1	Cost Estimation 1	Dr. Shen	-
21/09/2020 (Week 2)	Cost Estimation 2	Cost Estimation 2	Dr. Shen	-
28/09/2020 (Week 3)	Construction Safety and Quality Management	Construction Safety and Quality Management	Dr. Shen	-
06/10/2020 (Week 4)	Engineering Ethics	Engineering Ethics	Mr. Holdom	Individual Assignment – Part A
12/10/2020 (Week 5)	Contract Management	Contract Management	Dr. Barati	Mid-term Examination
19/10/2020 (Week 6)	Term Break	Term break	-	-
26/10/2020 (Week 7)	Engineering Economics	Engineering Economics	Dr. Barati	
02/11/2020 (Week 8)	Introduction to Project Management	Introduction to Project Management	Dr. Barati	-
09/11/2020 (Week 9)	Project Scheduling	Engineering Economics	Dr. Barati	-
16/11/2020 (Week 10)	Risk Management	Risk Management	Dr. Barati	Individual Assignment – Part B

ASSESSMENT

Assessment of this course comprises of an Individual Assignment in two parts, a Mid-term Examination, and a Final Examination.

1. **Individual Assignment**
   This submission is to be your own work and provides students the opportunity to work independently. Each student needs to nominate a construction project and prepare an Engineering Report on the project management, safety, quality, and ethics issues. Detailed description of the assignment and instruction of Engineering Report preparation will be provided in the Moodle. Each student is required to submit a pdf version of their assignment onto the Moodle by the due date.

2. **Mid-term Examination**
   The Mid-term Examination is an online open-book exam, and students can have access to all formulas and supplementary data deemed necessary to complete calculation questions. This Examination will be based on the lecture and workshop materials up to and including **WEEK 4**.

3. **Final Examination**
   The Final Examination will be externally conducted and scheduled by the UNSW Examinations Branch. Students will be informed via MyUNSW of the timetabling of this 2-hour Examination. This Examination is to assess student understanding of the course's significant technical content, based upon the presented lecture and workshop material from **WEEK 5 TO WEEK 10 inclusive**. The Final Examination is an online open-book exam, and students can have access to all formulas and supplementary data deemed necessary to complete calculation questions.

Students' final grade for this course requires that they complete the Mid-term Examination and Final Examination with the aggregated mark total of 24 or more marks for both Examinations before their assignment marks will be added. The 24 marks represents the minimum of 40% of the Examination component (40% of 60 marks allocated to Examinations). It is emphasised that a student does not have to gain 24 marks in each Examination to pass the course. Students who do not achieve this minimum Examination marks total will not be eligible to have the assignment marks added to their summed Examination mark, and so will only receive their Examinations mark as their final grade for this course.

Students who perform poorly in the Mid-term Examination and Workshops are recommended to discuss progress with the lecturer during the term.

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

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

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	Deadline for absolute fail	Marks returned
1. Assignment							
Individual Assignment	1 page	Part A 5 marks	1, 2, 3, 4	Each student needs to nominate a construction project and fill out the provided form.	Before 17:00h on 08OCT2021 Uploaded onto the Moodle	Part A - By 17:00h on 13OCT2021	Within 1 day
	Nominally 3000 words	Part B 35 marks	1, 2, 3, 4	Each student needs to prepare an Engineering Report on the project management, safety, quality, and ethics issues of the nominated construction project.	Part B - Before 17:00h on 21NOV2021 Uploaded onto the Moodle	Part B - By 17:00h on 26NOV2021	Within 2 weeks
2. Examinations							
Mid-term Examination	1.5 hours	25 marks	1,2,3,4,5	Mid-term Examination on material covered from Week 1 to Week 4 inclusive.	Wednesday 13OCT2021 Starting at 13:00h AEST		Within 2 weeks
Final Examination	2 hours	35 marks	1,2,3,4,5	Final Examination on material covered from Week 5 to Week 10 inclusive.	In the Formal Examination period		

RELEVANT RESOURCES

Textbook:
There is no prescribed textbook for this course

Moodle:
This subject has a Moodle site. It will contain additional resources for you.

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 Academic Advice on the School website available at:

https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw

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