School of Civil and Environmental Engineering

Term 3, 2020

CVEN3101
ENGINEERING OPERATIONS AND CONTROL

COURSE DETAILS

Units of Credit	6		
Contact hours	6 hours per week		
Lecture	Mondays	11:00 – 13:00	Online
	Tuesdays	12:00 – 14:00	Online
Workshops	Tuesdays	14:00 – 16:00	Online
	Tuesdays	14:00 – 16:00	Online
	Tuesdays	14:00 – 16:00	Online
	Tuesdays	14:00 – 16:00	Online
	Tuesdays	16:00 – 18:00	Online
	Tuesdays	16:00 – 18:00	Online
	Tuesdays	16:00 – 18:00	Online
	Wednesdays	14:00 – 16:00	Online
	Wednesdays	14:00 – 16:00	Online
	Wednesdays	14:00 – 16:00	Online
	Wednesdays	14:00 – 16:00	Online
	Wednesdays	16:00 – 18:00	Online
	Wednesdays	16:00 – 18:00	Online

Course Coordinator and Lecturer

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Lecturer

Dr. Johnson Shen

Professor David Carmichael

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 economic and financial issues. Finally, the course covers engineering ethic and its principles in construction industry.

HANDBOOK DESCRIPTION

See link to virtual handbook:

https://www.handbook.unsw.edu.au/undergraduate/courses/2020/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
- Understand and use project management tools such as Gantt chart and CPM charts
- Appreciate the key aspects of project management including time, cost, safety, ethic, and quality
- Understand the elements of economics and risk management
- Identify and explain key theories and concepts of project planning

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.	Become familiar with definitions of engineering and management work	PE1.3, PE1.5, PE2.1, PE2.2
2.	Understand and 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, ethic, and quality	PE1.2, PE2.3, PE2.4, PE3.4
4.	Understand the elements of economics and risk management	PE1.3, PE1.6, PE2.3, PE3.4
5.	Identify and explain key theories and concepts of project planning	PE1.1, PE1.3, PE2.1, PE2.4

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 2020

Date	Topic and Lecture Content	Demonstration 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 Economics	Engineering Economics	Professor Carmichael	Group Assignment – Part A
12/10/2020 (Week 5)	Risk Management	Risk Management	Professor Carmichael	Mid-term Examination
19/10/2020 (Week 6)	Term Break	Term break	-	-
26/10/2020 (Week 7)	Engineering Ethics	Engineering Ethics	Mr. Holdom	Individual Assignment
02/11/2020 (Week 8)	Introduction to Project Management	Introduction to Project Management	Dr. Barati	-
09/11/2020 (Week 9)	Project Scheduling	Project Scheduling	Dr. Barati	-
16/11/2020 (Week 10)	Project Planning and Monitoring	Project Planning and Monitoring	Dr. Barati	Group Assignment – Part B

ASSESSMENT

Assessment of this course comprises of two Assignments, a Mid-term Examination, and a Final Examination.

1. **Group Assignment**

   This submission is conducted in groups of three students and provides students the opportunity to learn how to work effectively in a team-based environment. Each group needs to nominate an under-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 group is required to submit only one copy of their assignment onto the Moodle.

2. **Individual Assignment**

   This submission is to be your own work and provides students the opportunity to work independently. In completing this assignment, students are required to provide a reflective assignment based on their learnings in **WEEKS 4 and 5.**

3. **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 3**.

4. **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 7 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 2020 will be held on Monday 11th January - Friday 15th January 2021 (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. Assignments							
Group Assignment	1 page	Part A 5 marks	1, 2, 3, 4	Assignment – Part A Completing the single page details	Before 17:00h on 09OCT2020 Uploaded onto the Moodle	Part A - By 17:00h on 14OCT2020	Within 2 days
	Nominally 3000 words	Part B 20 marks	1, 2, 3, 4	Group Assignment – Students work effectively in teams to nominate a construction project and prepare an Engineering Report.	Part B - Before 17:00h on 22NOV2020 Uploaded onto the Moodle	Part B - By 17:00h on 29NOV2020	Within 2 weeks
Individual Assignment	Nominally 5 pages	15 marks	1, 3, 4	Individual Assignment – Students work individually to prepare this assignment based on their learnings in Weeks 4 and 5.	Before 17:00h on 01NOV2020 Uploaded onto the Moodle	By 17:00h on 06NOV2020	Within 3 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 3 inclusive.	Tuesday 13OCT2020 Starting at 12:00h AEST		Within 2 weeks
Final Examination	2 hours	35 marks	1,2,3,4,5	Final Examination on material covered from Week 7 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://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

	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