School of Civil and Environmental Engineering

Term 1, 2021

# CVEN4050 THESIS A

## COURSE DETAILS

| | | |
|---|---|---|
| **Units of Credit** | 6 | |
| **Contact hours** | 4 hours per week | |
| **Class** | Monday, 14:00 – 16:00 | online |
| **Workshop** | Monday, 12:00 – 14:00 | online |
| | Monday, 16:00 – 18:00 | online |
| **Course Coordinator and Lecturer** | Mr Robert Holdom<br>email: robert.holdom@unsw.edu.au<br>office: CE211<br>phone: 02 9385 7773 | |

## INFORMATION ABOUT THE COURSE

This course is available to all Civil Engineering, Environmental Engineering and Surveying students who are completing their final year of study in their four year undergraduate degree. CVEN4050 forms the first part of the Coursework Thesis program, with CVEN4051 Thesis B, following this course in a later term. The intention with this course is to bring focus to the student about what they need to prepare for themselves to become ready for employment. The Thesis A topic is presented to the student as it would be in industry and each student is required to prepare an individual Thesis submission by way of an *Engineering Report* that contains all of the elements required within the Assessment Overview.

**The selected topic for Term 1, 2021 is Road Pavement Design.**

As the course will involve several submissions throughout the term, Thesis A will be completed incrementally. The final collation of a student's Thesis A submissions will allow them to compile Thesis A in a single volume in Engineering Report format to enable them to demonstrate their work to others.

**Prerequisite:** 132 UOCs needed to enrol in this course.

**Excluded:** CVEN4032, CVEN4033, CVEN4040, & CVEN4041.

## HANDBOOK DESCRIPTION

This course is the first of two parts and is undertaken before CVEN4051 Thesis B, usually in the proceeding semester. The Thesis involves formulating the designs for and solution to open-ended civil and/or environmental engineering problems. The problems will be drawn from industry and will be multi-disciplinary involving application of material learnt throughout the undergraduate program and will require creative thought. The course will include the preparation of relevant professional documents. Part A involves the formulation of a project plan, project brief and documents and involves review of various literature.

https://www.handbook.unsw.edu.au/undergraduate/courses/2021/CVEN4050/

## OBJECTIVES

The objective of this course is to provide students the opportunity to complete a project task that they might be expected to complete in their professional employment from one of the five key Civil Engineering disciplines offered under Thesis A. Students will be required complete their work individually but partake in discussion groups and a Workshop Presentation outline of their topic. Thesis A will build on the skills developed in any previous Civil Engineering Practice classes and include these 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
- A respect for ethical practice and social responsibility
- Advocacy, negotiation and communication skills
- Leadership and member roles in group-related professional engineering project completion
- Ability to incorporate related social, political, environmental and economic issues within technical engineering based solution options to community sensitive projects
- Undertake and execute a self-contained applied research report which may be understood and used by others with a technical background in the same discipline area as the topic.

## TEACHING STRATEGIES

The teaching strategies that will be used and their rationale:

| | |
|---|---|
| **Private Study** | • Review lecture material and seek out support reference materials to their topic<br>• Develop your personal timetable to complete the Thesis A submissions requirements on time<br>• Do set problems and assignments<br>• Check the course Moodle and your e-mail regularly for messages and notices<br>• Reflect on Workshop discussions in preparing Thesis A submission elements<br>• Download materials from Moodle<br>• Keep up with notices and find out marks via Moodle |
| **Lectures** | • Find out what you must research, learn and deliver<br>• Hear announcements on course changes |
| **Workshops** | • Be guided by Demonstrators<br>• Resolve group and individual problems and set tasks |

| | |
|---|---|
| | • Ask and answer questions<br>• Practice solving set problems/ follow Demonstrator guidance in preparing Thesis A submission elements<br>• Meet the timely submission requirements required by your Demonstrator |
| **Assessments** | • Demonstrate your knowledge and skills<br>• Demonstrate higher understanding and problem solving<br>• Demonstrate presentation and documented reporting skills |

## 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. | *In-depth engagement with the relevant disciplinary knowledge in its inter-disciplinary context.* | *PE1.3, PE2.3* |
| 2. | *Capacity for analytical and critical thinking and for creative problem solving.* | *PE1.2, PE2.2, PE2.3, PE2.4* |
| 3. | *Ability to engage independent and reflective learning.* | *PE3.1, PE3.2, PE3.3, PE3.4,* |
| 4. | *Skills for collaborative and multi-disciplinary work.* | *PE1.5, PE1.6, PE3.5, PE3.6* |
| 5. | *A respect for ethical practice and social responsibility.* | *PE1.5, PE1.6, PE3.1* |
| 6. | *Advocacy, negotiation and communication skills.* | *PE1.5, PE3.2, PE3.3* |
| 7. | *Leadership and member roles in group-related professional engineering project completion.* | *PE3.5* |
| 8. | *Ability to incorporate related social, political, environmental and economic issues within technical engineering based solution options to community sensitive projects.* | *PE1.5, PE1.6, PE2.1, PE2.4, PE3.1, PE3.4* |
| 9. | *Undertake and execute self-contained applied research report.* | *PE1.4, PE3.2, PE3.5* |

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

## COURSE PROGRAM

In commencing Thesis A the lectures will be presented by Mr Robert Holdom. All lectures and workshops will be delivered online throughout Term 1, 2021.

Guest Lecturers may be sought to present throughout the term to deliver topics that may assist students in the preparation of Thesis A, or develop other skills to prepare students entering the profession.

**Note: All students are required to review the weekly Lecture material and all students are required to attend their allocated Workshop which will commence from Week 2.**

The Workshops are scheduled in two 2-hour timeslots either preceding or following the lecture. Students are required to enrol into a nominated Workshop group and attend that Workshop weekly. Based on the current course enrolments, the Workshop groups are restricted to a maximum of 20 persons and within each group. Your Demonstrator may choose to allocate you into sub-group teams of between 4 and 5 students.

It is a course requirement that every student is available each week to discuss Thesis A progress with their Demonstrator. You will receive from your Demonstrator, feedback and advice in the preparation of Thesis A. Take heed of the advice as your Demonstrator is one of the markers of your Thesis A submission.

**Workshop attendance is a compulsory requirement in completing CVEN4050 Thesis A.**

**Demonstrators have a requirement to keep record of their Workshop attendances each week.**

**Term 1, 2021**

| Date | Topic and Lecture Content | Demonstration Content |
|---|---|---|
| 15/02/2021<br>(Week 1) | **Course Introduction**<br>Introduction to Pavement design in Australia<br><br>Outline of Thesis A requirements<br>Flexible Pavement Design | No Workshop in Week 1 Students to self-enrol into Workshop Groups on the Moodle from the end of Week 1 and attend first scheduled Workshop in Week 2<br>Commence Assessment Task 1a |
| 22/02/2021<br>(Week 2) | Flexible Pavement Design continued with focus on Assessment Task 1a | Workshop commencement<br>Students to continue with Assessment Task 1a and consult with your Demonstrator using Moodle<br>Continue Assessment Task 1a |
| 01/03/2021<br>(Week 3) | Flexible Pavement Design continued with focus on Assessment Task 1b | **Submit Assessment Task 1a**<br>Commence Assessment Task 1b |
| 08/03/2021<br>(Week 4) | Flexible Pavement Design continued | Continue Assessment Task 1b |
| 15/03/2021<br>(Week 5) | Rigid Pavement Design | **Submit Assessment Task 1b**<br>Commence Assessment Task 2 |
| 22/03/2021<br>(Week 6) | ***Flexibility week for all courses (non-teaching)***<br>***No class.***<br>Commence Thesis A write-up | ***No class.***<br>Continue Assessment Task 3<br>Continue Assessment Task 2 |
| 29/03/2021<br>(Week 7) | Rigid Pavement Design continued | Continue Assessment Task 2 |
| 05/04/2021<br>(Week 8) | ***Easter Monday Public Holiday***<br>***No class.*** | ***No class.***<br>**Submit Assessment Task 2**<br>Continue Assessment Task 3 |
| 12/04/2021<br>(Week 9) | Design of flexible pavements for Local Government Roads<br>Completing Thesis A write-up<br>Thesis B Introduction | Continue Assessment Task 3 |
| 19/04/2021<br>(Week 10) | Design of flexible pavements for Local Government Roads continued<br>Conducting a Literature Search<br>Preparing a Resume and Covering Letter<br>The Job Interview | **Submit Assessment Task 3**<br>Guidance on Thesis B Literature Search |

## ASSESSMENT

*There will be NO formal examination for Thesis A. 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 1a (individual submission) – Granular pavement/thin surfacing (5%) – due Week 3***

***Assessment Task 1b (individual submission) – Stabilised pavement/Asphalt (25%) – due Week 5***

***Assessment Task 2 (individual submission) – Rigid pavement (30%) – due Week 8***

***Assessment Task 3 (individual submission) – Final Report (40%) – due Week 10***

*Your Final Mark for Thesis A will be aggregated total of all Thesis A assessment tasks. The Final Grade for Thesis A is as per the university's Mark/ Grade scale. The Thesis A document is to conform to the guidelines given to you throughout the Term. You will not be required to submit a printed copy of your compiled Thesis A. However, you should be considering doing the same so that you can take the document to an employment/ job interview.*

*Your Assessment Task submissions will be marked by your Workshop Demonstrator and separately by another marker. This is to maintain quality standards across the course and within each Workshop.*

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

*[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 CVEN4050 Thesis A, please note: Supplementary Examinations for Term 2, 2021 will be held between Monday 24th May 2021 and Friday 28th May 2021, 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

*As outlined in the Assessment Overview, there is no provision being allowed for late submissions in Thesis A. Students should consider that this course operates as does business, in that SET DEADLINES have to be met. You are thereby advised to plan and use your time wisely in preparing your work in meeting the deadlines.*

**ASSESSMENT OVERVIEW**

| Item | Length | Weighting | Learning outcomes assessed | Assessment Criteria | Due date and submission requirements | Deadline for absolute fail | Marks returned |
|---|---|---|---|---|---|---|---|
| Assessment Task 1a<br>Flexible Pavement:<br>Granular layer and thin bituminous layer | Appendix calculations | 5% | 1, 2, 3, 4, 5 & 7 | In successfully making a timely and correct submission of Assessment Task 1a, you will receive the 5 marks allocated for Assessment Task 1a.<br>This submissions will be part of the Appendices within Thesis A. | Before 5pm on 4th March, 2021<br>*Upload to Moodle* | There are no extensions on any of these elements, so the posted due dates are final. | Week 4 |
| Assessment Task 1b<br>Flexible Pavement: Asphalt and stabilised pavement layers | Appendix calculations | 25% | 1, 2, 3, 4 & 7 | Your submission will be graded against your specific data set and making a timely and correct submission for Assessment Task 1b.<br>This submissions will be part of the Appendices within Thesis A. | Before 5pm on 18th March, 2021<br>*Upload to Moodle* | | Week 7 |
| Assessment Task 2<br>Rigid Pavement Design | Appendix calculations | 30% | 1, 2, 3, 4 & 7 | Your submission will be graded against your specific data set and making a timely and correct submission for Assessment Task 1b.<br>This submissions will be part of the Appendices within Thesis A. | Before 5pm on 8th April, 2021<br>*Upload to Moodle* | | Week 10 |
| Assessment Task 3<br>Thesis A Document | 8 pages | 40% | 1, 2, 3, 6, 8 & 9 | The Thesis A document is to be presented as an *Engineering Report* and will be marked accordingly:<br>Executive Summary: 10%<br>Presentation/ content: 15%<br>Writing/ reference quality: 15% | Before 5pm on 22nd April, 2021<br>*Upload to Moodle* | | Post course |

## RELEVANT RESOURCES

There are no prescribed texts for Thesis A.

The lecturer may provide you with prescribed readings for each lecture topic and:

- You are required to conduct your own Literature research in completing CVEN4050 Thesis A. This should be discussed with your Demonstrator and the UNSW library staff by making an online inquiry as to how you can undertake independent research and find your resources.
- 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 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 |