

CVEN4050

Thesis A

Term 3, 2022



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Michael Manefield	manefield@unsw.edu.au	Business hours	Office 516a Hilmer Building	040547706 6

School Contact Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

Course Details

Units of Credit 6

Summary of the Course

This course is the first of two parts and is undertaken before CVEN4051 Thesis B, which should be taken in the following term. 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.

Course Aims

This course enhances the student's skills for undertaking scholarly enquiry by attempting to achieve a specific topic objective within a defined period of time. A significant component of the course relates to the review of literature, which promotes independent and reflective learning as well as increases students' capacity to develop information literacy. The thesis is expected to reinforce the student's ability and confidence in the written communication of technical information.

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Assemble comprehensive and reliable data as part of a research project	PE3.1, PE3.2, PE3.3, PE3.4, PE3.5, PE3.6
2. Appraise and critique an aspect of an infrastructure system via a literature review or through use of accepted industry design processes	PE1.1, PE1.2, PE1.3, PE1.4, PE1.5, PE1.6, PE2.1, PE2.2, PE2.3, PE2.4, PE3.1, PE3.2, PE3.4
3. Demonstrate critical thinking and research skills and critique industry practices in formulating responses to problems relating to the role of civil and environmental engineers	PE1.1, PE1.2, PE1.3, PE1.4, PE1.5, PE1.6, PE2.1, PE2.2, PE2.3, PE2.4
4. Apply engineering principles, such as risk management, decision making and design in developing solutions to real-world problems that are ethically sound	PE2.1, PE2.2, PE2.3, PE2.4
5. Demonstrate professional level written communication skills	PE3.2

Teaching Strategies

The Honours Thesis is an individual thesis in which each student works under the guidance of academic staff with input from industry specialists. Topics are related to industry projects selected from contemporary practice. The work involves industry based investigations and design applications.

Additional Course Information

This Thesis A course uses contaminated site remediation as a vehicle to deliver thesis project learning objectives. Environmental pollution is a major threat to human and environmental health globally. Civil engineering projects often have to resolve site contamination before proceeding with construction. Remediation of contaminated sites is a multidisciplinary endeavour requiring engagement of civil, environmental and chemical engineers, surveyors and scientists (biologists, chemists and environmental scientists). Thesis A will focus on contaminated site characterisation and development of conceptual site models. Subsequently, Thesis B will focus on remediation options assessment and remediation action plans in the following term. Both courses will require application of material learnt throughout the undergraduate program, independent creative thought and reviewing of literature. It is expected that you will dedicate approximately 8 hours to this subject per week.

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Thesis	50%	11/11/2022 05:00 PM	1, 2, 3, 4, 5
2. Assignments and presentation	50%	Not Applicable	1, 2, 3, 4, 5

Assessment 1: Thesis

Assessment length: 10 pages

Due date: 11/11/2022 05:00 PM

Deadline for absolute fail: Five days after due date

Marks returned: Two weeks after submission

This thesis exercise seeks to develop and test your ability to demonstrate contextual understanding of a complex problem, analyse technical complexities to deliver an informed position statement, evaluate risks, formulate strategies and recommendations, effectively self-manage and demonstrate commitment to a team and generate a professional document including an executive summary. Submit individual reports.

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Assessment criteria

Student submissions will be graded according to the following scheme with equal weight given to the following four categories:

Appropriate: Does the submission adhere to requirements? Has the student understood what was expected of them in this assignment? Is the information presented relevant to the task?

Correct: Is the information presented factually correct or accurate? Does the content of the submission reflect reality? Is the submission free of meaningless qualitative hyperbole?

Professional: Is the structure, writing quality and document aesthetic of professional standard? Does the submission give the impression it was prepared by a mature professional engineer?

Engaged: Is there evidence of engagement with the task beyond basic requirements? How deeply has the student investigated resources available to produce the submission?

Additional details

Each individual must submit a professional report including an executive summary describing your position on liability in a mock contaminated site scenario. Include 1) a conceptual site model, 2) a position statement regarding risk and liability, 3) recommendations for a detailed site investigation, 4) suggestions for a remediation action plan and 5) an executive summary.

Each individual must submit a ten page report. All report components must fit within this ten page limit, including title page, table of contents, executive summary, references and appendices. No exceptions.

There are no formal requirements with respect to report structure. It is up to you to develop an optimal structure. You will work in groups to consider the available data and possible position statements, site model concepts, further investigation strategies and remediation actions to mitigating the risk the contamination poses. Your submission, however, is individual work. You may use resources generated by your group (eg. figures) but you can generate your own and you do not have to adhere to group consensus. Submit your pdf file via Turnitin in Moodle by 5 pm Friday of Week 9. You can make your submission earlier if it is more convenient. Late submissions will be penalised by 5% per day. The deadline for absolute fail (zero grade) is 5 days after the submission deadline. Special consideration requests are to be made via Moodle.

Assessment 2: Assignments and presentation

Assessment length: Varied

Submission notes: Assignments submitted as pdf via Turnitin. Presentation submitted as MP4 via Media Gallery.

Deadline for absolute fail: One week after submission deadline

Marks returned: Two weeks after submission deadline

This component of course assessment consists of two assignments worth 20% each and a presentation worth 10%.

Assessment criteria

Appropriate: Does the submission adhere to requirements? Has the student understood what was expected of them in this assignment? Is the information presented relevant to the task?

Correct: Is the information presented factually correct or accurate? Does the content of the submission reflect reality? Is the submission free of meaningless qualitative hyperbole?

Professional: Is the structure and quality of vocal delivery and visual aids of professional standard? Does the submission give the impression it was prepared by a professional?

Engaged: Is there evidence of engagement with the task beyond basic requirements? How deeply has the student investigated resources available to produce the submission?

Additional details

Assignment 1: This assignment requires you to report on the risks site contamination pose to civil engineering projects. Using contemporary examples, describe how insufficient consideration of chemical contamination of the environment has disrupted engineering works or produced stranded assets and how adequate planning could have avoided the situation. Discuss where the liability rests. Examples of successful remediation works that enabled developments to proceed smoothly can also be included. Use internet searches to discover relevant news stories and related information for your report. Suggested time commitment – 10 hours. Your submission should be no longer than five pages in total. No exceptions. This includes figures and references. You don't need a title page or appendices, but if you want to include them, they must fit within the five page limit. There are no specific requirements for structure or word or character count. Submit as a pdf via Turnitin on Moodle by 5 pm Friday of Week 3. Late submissions will be penalised by 5% per day. The deadline for absolute fail (zero grade) is 5 days after the submission deadline. Special consideration requests are to be made via Moodle (not the course coordinator).

Assignment 2: This assignment requires you to deliver an executive summary review of a site characterisation training software package (TEMPO). This can focus on any aspect of the software from technical aspects of the interface to its effectiveness as a training tool. Include 1) a description of the software and its purpose, 2) comments on positive aspects of the software and 3) suggestions for improvements that could be made. The TEMPO software package is available at <http://prjweb03.geosyntec.com/tempo/geoform/>. The TEMPO User Guide available on the site should be consulted. Suggested time commitment – 10 hours. This submission has a one page limit. Title page, references and appendices can be included beyond the one page limit. There are no specific requirements for structure or word or character count. Submit as a pdf via Turnitin on Moodle by 5 pm Friday of Week 7. Late submissions will be penalised by 5% per day. The deadline for absolute fail (zero grade) is 5 days after the submission deadline. Special consideration requests are to be made via Moodle.

Presentation: Produce and submit a video presentation outlining your proposal for a detailed site investigation for groundwater contamination in the fictional suburb of Darlington. Produce a 5 minute MP4 video presentation with visual aids. The structure and content of your presentation is in your capable hands. There are no specific requirements for numbers of slides though one slide per minute is standard. Submit the file to your media gallery in Moodle by 5 pm Friday of Week 10. You can make your submission earlier if it is more convenient. Instructions for submitting video will be supplied. Late submissions will be penalised by 5% per day. The deadline for absolute fail (zero grade) is 5 days after the submission deadline. Special consideration requests are to be made via Moodle.

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
O-Week: 5 September - 9 September	Homework	Review course outline
Week 1: 12 September - 16 September	Lecture	Course introduction
Week 2: 19 September - 23 September	Lecture	Field site characterisation and monitoring
Week 3: 26 September - 30 September	Lecture	Conceptual site models
	Assessment	Assignment 1 due (20%) - Impact of site contamination on infrastructure development
Week 4: 3 October - 7 October	Lecture	Physical and chemical remediation options
Week 5: 10 October - 14 October	Lecture	Biological remediation options
Week 6: 17 October - 21 October	Homework	Flexibility week
Week 7: 24 October - 28 October	Lecture	Legislation and regulation
	Assessment	Assignment 2 due (20%) - Review of site characterisation training software
Week 8: 31 October - 4 November	Workshop	Thesis help session
Week 9: 7 November - 11 November	Workshop	Thesis help session
	Assessment	Thesis due (50%) - Position statement on Darlington (mock) case study
	Assessment	Thesis
Week 10: 14 November - 18 November	Lecture	No lecture
	Assessment	Thesis presentation (10%) - Video presentation of position statement

Resources

Prescribed Resources

- Lecture series by government and industry experts. You will hear from professionals about various aspects of site remediation. Slides and recordings available on Moodle.
- National Environment Protection (Assessment of Site Contamination) Measure 1999 – available online (<https://www.legislation.gov.au/Details/F2013C00288>)
- Guideline on performing remediation options assessment (https://www.crccare.com/files/dmfile/GuidelineonconductingROA_Rev2.pdf).
- Guideline on performing cost-benefit and sustainability analysis of remediation options (https://www.crccare.com/files/dmfile/GuidelineonpeformingCBandSAofremediationoptions_Rev0.pdf).
- Conceptual Site Model Orica Botany. (https://www.orica.com/Locations/Asia-Pacific/Australia/Botany/Botany-Transformation-Projects/Groundwater-Cleanup#.XQL9_y17Gi4)
- Additional materials provided on Moodle.

Submission of Assessment Tasks

Please refer to the Moodle page of the course for further guidance on assessment submission.

UNSW has a standard late submission penalty of:

- 5% per day, for all assessments where a penalty applies, capped at five days (120 hours), after which a student cannot submit an assessment, and no permitted variation.

Academic Honesty and 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 Information

Final Examinations:

Final exams in T3 2022 will be held online between 25th November - 8th December 2022 inclusive, and supplementary exams between 9th - 13th January 2023 inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

ACADEMIC ADVICE

- 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>
- [Key UNSW Dates](#) - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.
- 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](#)
- Book an Academic Advising session: <https://app.acuityscheduling.com/schedule.php?owner=19024765>

Disclaimer

This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up to date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.

Image Credit

Mike Gal.

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	✓
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	✓
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	✓
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	✓
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering 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	✓
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	✓
PE3.2 Effective oral and written communication in 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	✓