

CVEN4951, CVEN9451

Research Thesis A

Term 2, 2023



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Asal Bidarmaghz	a.bidarmaghz@unsw.edu.au	email	Room 502, Level 5, School of Civil and Environment al Engineering (H20)	

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 4

Summary of the Course

The thesis provides an opportunity for you to bring together engineering principles learned over your previous years of study and apply these principles to innovatively solve problems such as the development of a specific design, process and/or the investigation of a hypothesis. Thesis projects are complex, open-ended problems that allow room for your creativity, and the acquisition, analysis and interpretation of results. There are multiple possible solutions or conclusions at the outset and sufficient complexity to require a degree of project planning. The thesis requires you to formulate problems in scientific or engineering terms, manage a technical project and find solutions by applying scientific and engineering methods. You will also develop their ability to work in a research and development environment. You must identify a supervisor and project prior to enrolling in this course. This is the first course of the 3 course thesis structure.

Honours Thesis A:

Pre/Co-requisites:

- Only students who have completed 126 units of credit, and have also achieved the required weighted average mark as determined by the School (WAM > 70%) will be permitted to enrol in Honours Research Thesis.
- In addition, all students enrolled in Research Thesis must take CVEN4701 Planning Sustainable Infrastructure as one of their discipline electives, OR GMAT4150 Field Projects 2 for Surveying students.

FAIL/LATE PENALTIES AND PROCEEDURES

Fail in Research Thesis A – must re-enrol in Research Thesis A again (or enrol in CVEN4050)

Fail in Research Thesis B - must re-enrol in Research Thesis B again (or enrol in CVEN4050)

Fail in Research Thesis C – Students have three options.

1. re-enrol for Research Thesis A, B & C again, new project and supervisor
2. re-enrol for Research Thesis C again, same project - needs consent of an appropriate supervisor & student
3. Student does further work, re-submits thesis after a max of 6 weeks. Course mark capped at 50%. If still not satisfactory, then needs to re-enrol. (This option is only available if the original mark was ≥ 40 , OR if the student is in their last term before graduation, regardless of the original mark).

Master Thesis A:

FAIL/LATE PENALTIES AND PROCEEDURES

Fail in Thesis A – must re-enrol in Thesis A again.

Fail in Thesis B - must re-enrol in Thesis B again

Fail in Thesis C – Students have three options:

1. re-enrol for Thesis A, B & C again, new project and supervisor
2. re-enrol for Thesis C again, same project - needs consent of an appropriate supervisor & student
3. Student does further work, re-submits thesis after a max of 6 weeks. *Course* mark capped at 50%. If still not satisfactory, then needs to re-enrol. (This option is only available if the original mark was ≥ 40 , OR if the student is in their last term before graduation, regardless of the original mark).

Course Aims

The thesis provides an opportunity for the student to bring together engineering principles learned over their previous years of study and apply these principles to innovatively solve problems such as the development of a specific design, process and/or the investigation of a hypothesis. Thesis projects must be complex, open-ended problems that allow room for student creativity, and the acquisition, analysis and interpretation of results. There must be multiple possible solutions or conclusions at the outset and sufficient complexity to require a degree of project planning from the student. The thesis requires the student to formulate problems in engineering terms, manage an engineering project and find solutions by applying engineering methods. Students also develop their ability to work in a research and development environment.

Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Develop a design or a process or investigate a hypothesis following industry and professional engineering standards.	PE2.1, PE2.2, PE2.3, PE2.4
2. Critically reflect on a specialist body of knowledge related to their thesis topic.	PE1.3
3. Apply scientific and engineering methods to solve an engineering problem.	PE2.1
4. Analyse data objectively using quantitative and mathematical methods.	PE1.2, PE2.1, PE2.2
5. Demonstrate oral and written communication in professional and lay domains.	PE3.2

Teaching Strategies

The course is taught as an individual research project, to develop a level of research skills and autonomy.

Additional Course Information

This course is in three parts. Research Thesis A is undertaken in the first term of enrolment. Research Thesis A is a prerequisite for Research Thesis B, which in turn is a prerequisite for Research Thesis C.

By default, students must ordinarily take Research Thesis A, B and C in three consecutive terms.

With School permission, students may request to take Research Thesis A in one term then Research B + C concurrently in the following term. This option is strictly limited only to students who can demonstrate the ability to progress. Further details are provided in the ASSESSMENTS section below.

Students may enrol in up to and including 20 UoC while undertaking Research Thesis without being considered as overloading. Students who enrol in 22 UoC or more while undertaking Thesis are considered to be overloading and will require permission to do so.

By default, students cannot undertake Industrial Training while enrolled in Research Thesis B unless exceptional circumstances are demonstrated by the student and accepted by the School.

Prerequisite:

Only students who have completed 126 units of credit, and have also achieved the required weighted average mark as determined by the School (WAM > 70%) will be permitted to enrol in Honours Research Thesis. In addition, all courses to the end of Year 3 in the discipline of the thesis topic need to be completed.

Where can I find more information?

Find more information about the structure of the Research Thesis on the School website [here](#).

PROCEDURE FOR SELECTION OF A RESEARCH TOPIC

Your priority is to find a Supervisor and agree on a topic BEFORE ENROLLING in Research Thesis A.

- Browse online ('search projects') the selection of available topics and identify potential supervisors

<http://intranet.civeng.unsw.edu.au/info-about/student-intranet/honours>

Note: It is unlikely that this list is fully up-to-date and comprehensive. It is essential that during the Term prior to enrolment in Research Thesis A that individual students approach School teaching staff in area(s) of potential interest, to explore the range of possible thesis topics that may be available.

- Discuss your selection with potential topic supervisors
- Once you have a Supervisor and topic, you will need to download, complete and sign (both you and your Supervisor) a [Research Thesis Form](#) enrol yourself on myUNSW then upload the signed form to the Student Intranet here: <http://intranet.civeng.unsw.edu.au/info-about/student-intranet/submit-thesis-application-form>
- Please note that you will only be able to complete course enrollment for CVEN4951. The School will complete your class registration once you've submitted your topic nomination form to the Student Intranet

Please note that if you cannot find an Honours Research Thesis Supervisor by the start of Term A, then you will not be allowed to enrol/continue in the course and it will be automatically dropped from your enrolments. As the alternative, you may choose to enrol the parallel Honours course CVEN4050 (Thesis A) for which an individual supervisor is not required.

WHY WRITE AN HONOURS RESEARCH THESIS?

Satisfy your intellectual curiosity

This is the most compelling reason to write a research thesis. You have studied courses during your degree that perhaps really piqued your interest. Now's your chance to follow your passions, explore further, and contribute some original ideas and research in your field.

Develop transferable research skills

Whether you choose to pursue further research (e.g. complete a Ph.D) or not, the process of developing and crafting a feasible research project will polish skills that will serve you well in almost any future job. After all, most jobs require some form of problem solving and oral and written communication. Writing an honours thesis requires that you:

- ask smart questions
- acquire the investigative instincts needed to find answers
- navigate libraries, laboratories, archives, databases, and other research venues
- develop the flexibility to redirect your research if your initial plan flops
- master the art of time management
- sharpen your argumentation skills
- organize a lengthy piece of writing
- polish your oral communication skills by presenting and defending your research to academic staff and students

Work closely with academic staff

At large research universities like UNSW, you have likely taken classes where you barely got to know your lecturer. Writing a thesis offers the opportunity to work one-on-one with an academic supervisor. Such relationships can enrich your intellectual development and later serve as invaluable references for postgraduate degree and employment.

Open windows into future professions

An honours research thesis will give you a taste of what it's like to do research in your field. It also might help you decide whether to pursue that field in your future career.

Assessment

Research Thesis A: covers the planning/preparing and completion of the initial work on the project, including undertaking a comprehensive literature review related to their specific area of research.

Research Thesis B: continue to progress the research and commence the writing of methodology and results chapters of the thesis.

Research Thesis C: Thesis C complete any outstanding lab/field/modelling research and analyses; complete and submit the keystone deliverable Research Thesis; and present findings to staff and peers at a research seminar/video presentation.

In the event of an unsatisfactory assessment in Research Thesis A or Research Thesis B, a student must submit a show cause. A plan of future action to improve student performance must be prepared and agreed upon by both the supervisor and course coordinator before progress to Research Thesis B or Research Thesis C is allowed. Failure to receive the progress assessment by the due date will result in the student results being withheld and/or failure.

PROCEDURE FOR SEEKING APPROVAL TO ENROL IN RESEARCH THESIS B + C CONCURRENTLY

With Supervisor and School approval, students who demonstrate accelerated progress during Research Thesis A may be permitted to enrol in a 4+8 UoC structure, where Research Thesis B and C are both taken in the same term after Research Thesis A.

Students should submit their request to undertake Research Thesis B+C (concurrent) at the same time that they submit their extended Component A2 submission (see the ASSESSMENTS section above for the additional content to be include). The Course Coordinator will email all students closer to this date with detailed instructions on how to do this.

It is strongly recommended that you discuss with your supervisor, prior to submitting your formal request for approval. Once your application for concurrent B+C is received, your supervisor will be asked to approve or decline this request (again, you will receive an email outlining how to do so closer to the date).

Students who do not demonstrate sufficient progress during Research Thesis A may be instructed to change enrolment and complete Research Thesis C in a third term after Research Thesis B.

Honours Thesis A:

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& student

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2. re-enrol for Thesis C again, same project - needs consent of an appropriate supervisor & student
3. Student does further work, re-submits thesis after a max of 6 weeks. *Course* mark capped at 50%. If still not satisfactory, then needs to re-enrol. (This option is only available if the original mark was ≥ 40 , OR if the student is in their last term before graduation, regardless of the original mark).

Late Procedure – In all cases, applications for late submission can be applied for BEFORE the due date. This is at the discretion of the Thesis Coordinator, but should only be granted in exceptional circumstances. As per normal, students can also apply through myUNSW for special consideration.

- For all other assignments beside thesis – zero (0) mark is awarded
- For thesis – 5 marks off the *thesis* for every day late. Penalty applies until the marks for the *course* decrease to 50, and further lateness does not result in failure of the *course*, but might be a failure of the thesis (weekends count as days).
- Any thesis not turned in within 6 weeks after the deadline will be finalised at zero (0) marks.

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Component A1 - Literature review and problem statement	100%	4:00pm Friday, WEEK 7	1, 4, 5
2. Component A2 - Literature review and problem statement	10%	4pm Friday WEEK 10	1, 4, 5

Assessment 1: Component A1 - Literature review and problem statement

Assessment length: As advised by supervisor

Submission notes: To be provided directly to supervisor by due date

Due date: 4:00pm Friday, WEEK 7

- Project proposal (start of-term); Short (2-3 pages) based on pro forma;
- Project presentation and report; Report limited to 10-15 pages;
- Supervisor report
- Satisfactory/unsatisfactory

Assessment 2: Component A2 - Literature review and problem statement

Assessment length: to be advised by supervisor

Submission notes: To be provided directly to supervisor by due date

Due date: 4pm Friday WEEK 10

- Project proposal (start of-term); Short (2-3 pages) based on pro forma;
- Project presentation and report; Report limited to 10-15 pages;
- Supervisor report
- 10% of Final Mark

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: 22 May - 26 May		
Week 2: 5 June - 9 June	Seminar	Attend and participate in live and interactive online Course Orientation workshop (literature review and problem statement). See Moodle for further details. This session will also be recorded. Date: Friday, 9th June 1200-1300 Venue: K-E19-G02 - Oshane G02 (previously known as CLB 1) All students are expected to join in person - except for those who are outside sydney at this date (Teams link will later be available on moodle).
Week 3: 12 June - 16 June		
Week 4: 19 June - 23 June		
Week 5: 26 June - 30 June		
Week 6: 3 July - 7 July		
Week 7: 10 July - 14 July	Assessment	Assessment A1 is due to be handed directly to Supervisor by Friday 4pm.
Week 8: 17 July - 21 July		
Week 9: 24 July - 28 July		
Week 10: 31 July - 4 August	Assessment	Assessment A2 is due to be handed directly to Supervisor by Friday 4pm.

		<p>NOTE: If students are seeking to apply for permission to enrol concurrently in Research Thesis B + C in the following Term, then the additional requirements are that the A2 submission must also include a Thesis Outline (Chapters and indicative sub-headings) plus a 1 – 2 page description of Research Methodology, sufficient to indicate clear understanding of the nature and extent of the work required.</p>
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Resources

Prescribed Resources

This is project-specific, and will be advised by your supervisor(s).

Recommended Resources

Honours Thesis Writing for Engineering Students: <https://student.unsw.edu.au/honours-thesis-writing-engineering-and-science-students>

Online iWrite thesis writing tutorial: <http://iwrite.sydney.edu.au/tutorials/start/starthere.htm>

- Topic material as direct by the supervisor.
- Materials provided by course coordinator.

References on writing style and technical communication skill:

- Lindsay, D “A Guide to Scientific Writing” 2nd ed. Longman, 1995
- Eisenberg, A “Effective Technical Communication” 2nd ed. McGraw-Hill, 1992.
- Evans, D. “How to write a better thesis or report” Melbourne University Press, 1995.
- Winkle, A and Hart, B “Report writing Style Guide for engineering students” 3rd ed. Faculty of Engineering, Flexible Learning Centre, University of South Australia, 1996.

Course Evaluation and Development

Feedback from students is welcomed, and is used to continuously improve the course outcomes and experiences for students.

Laboratory Workshop Information

To be discussed with supervisor(s)

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 T2 2023 will be held on campus between Friday 11th and Thursday 24th August (inclusive), and Supplementary Exams between Monday 4th and Friday 8th September (inclusive). You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

For students enrolled in the distance offering of a postgraduate course, and who reside further than 100km from UNSW Kensington campus, will be contacted regarding sitting an external exam. The school's External Exam Policy can be found on the Intranet.

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://unswengacademicadvising.as.me/schedule.php>

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	