School of Civil and Environmental Engineering
Term 1, 2023

CVEN4951/4952/4953 Honours Research Thesis A, B, C

COURSE DETAILS

Units of Credit 4 (A) + 4 (B) + 4 (C)

Contact hours as agreed with supervisor

Course Coordinator: Professor Ian Turner (Term 1)
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INFORMATION ABOUT THE COURSE

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 ASSESSMENT 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.

Students who wish to undertake Research Thesis B and Industrial Training concurrently in the same Term should first seek approval from the Thesis Coordinator and their Supervisor.

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.

Where can I find more information?

Find more information about the structure of the Honours Research Thesis here.

HANDBOOK DESCRIPTION

The thesis may describe directed laboratory, investigatory, design, field or research work on an approved subject and will be completed under the guidance and supervision of a member of the School's academic staff.

Online Handbook description is available at MyUNSW:

www.handbook.unsw.edu.au/undergraduate/courses/2023/CVEN4951.html
www.handbook.unsw.edu.au/undergraduate/courses/2023/CVEN4952.html
www.handbook.unsw.edu.au/undergraduate/courses/2023/CVEN4953.html

PROCEDURE FOR SELECTION AND CONFIRMATION OF A RESEARCH THESIS 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 & research 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
- Note that you will only be able to complete course enrolment 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 ENROL IN THE PARALLEL HONOURS COURSE CVEN4050 (THESIS A) FOR WHICH AN INDIVIDUAL SUPERVISOR IS NOT REQURIED.

OBJECTIVES

The Honours Research Thesis is an individual project in which each student works under the guidance of a nominated member of the academic staff (supervisor). A co-supervisor may also be nominated depending on the set up of the project. The research may involve laboratory experiments, field or industry-based investigations, design applications or theoretical research.

The Honours Research Thesis aims to provide students with the opportunity to:

- Undertake and execute an academic research project;
- Produce a self-contained research thesis, which may be understood and used by others with technical background knowledge in the same discipline area as the thesis topic, and may potentially be suitable for publication;
- Present their research in a seminar/video.

WHAT IS AN HONOURS RESEARCH THESIS?

That depends quite a bit on your field of study. However, all honours theses have at least two things in common:

- They are based on students' original research.

- They take the form of a written report, which presents the findings of that research.

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.

TEACHING STRATEGIES

The Honours Research Thesis is an individual project in which each student works under the guidance of a nominated member of the School's academic staff ('supervisor'). One or more co-supervisors (including from outside the School) may also be nominated depending on the set up of the project. The research may involve laboratory experiments, field or industry-based investigations, design applications or theoretical investigation.

PRIVATE STUDY

- As a rough guide only, an average student would be expected to spend approximately 10 hours per week on work related to this course.
- More guidance is needed initially from the supervisor when the topic is being defined to establish the objectives and methodology of the thesis.

SUPERVISION

- There are no specific hours assigned to this course, except for the scheduled Lunchtime Workshops (see below).

- Meetings between the supervisor(s) and the student may take place periodically or by private arrangement.
- Should supervisors be on study leave or unavailable for a considerable period of the session, alternative arrangements need to be established and made known to both the student and course coordinator.

CONSULTATION

- The course coordinator will be available by prior appointment to liaise with enrolled students as needed.

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**
CLO1	*Develop a design or a process or investigate a hypothesis following industry and professional engineering standards.*	PE2.1, PE2.2, PE2.3, PE2.4
CLO2	*Critically reflect on a specialist body of knowledge related to their thesis topic.*	PE1.3
CLO3	*Apply scientific and engineering methods to solve an engineering problem.*	PE2.1
CLO4	*Analyse data objectively using quantitative and mathematical methods.*	PE1.2, PE2.1, PE2.2
CLO5	*Demonstrate oral and written communication in professional and lay domains.*	PE3.2

IT IS ESSENTIAL THAT YOU REGULARLY CHECK YOUR OFFICAL UNSW EMAIL FOR UPDATES, REMINDERS, ETC.

ASSESSMENT – KEY DATES FOR YOUR DIARY

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.

The following course assessments relate to the student's research planning (A), conducting the research project and writing the thesis document (A, B & C), and disseminating the results in different forms (A, B & C).

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.

RESEARCH THESIS A SUBMISSIONS

- **Component A1 submission** should include**:** Statement of the Problem and draft Literature Review.
- **Component A2 submission** should include: More detailed, revised and improved Introduction (Statement of the Problem); and an enhanced Literature Review, incorporating Supervisor feedback.

  NOTE: If students are seeking to apply for permission to enrol concurrently in Research Thesis B + C in the following Trimester, 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.

- **Lunchtime Workshops:** - Course Orientation (week 1)
  - Literature Review Workshop (week 2)

1. **Component A1 is due: WEEK 7**
2. **Component A2 is due: WEEK 10**

Submissions A1 & A2 must be provided to the supervisor by 4.00pm Friday of the submission week.

RESEARCH THESIS B SUBMISSIONS

- **Component B1 submission:** Progress Report – this will take the form of an improved and extended A2 submission, including a detailed Thesis Outline (chapter and sub-headings), Research Methodology and preliminary Results and Analyses.
- **Lunchtime Workshop:** Thesis Writing Workshop (Week 3)

1. Component B1 is due: WEEK 3 for students enrolled in Research Thesis B+C concurrently

WEEK 8 for students enrolled in Research Thesis B only

Submission B1 must be provided to the supervisor by 4.00pm on Friday of the submission week.

SUMMARY OF ALL RESEARCH THESIS MARKED ASSESSMENTS

Research Thesis A:			
1.	Component A1	Week 7	**satisfactory/unsatisfactory**
2.	Component A2	Week 10	**10 % of Final Mark**
Research Thesis B:			
1.	Component B1	Week 8 (B+C: Week 3)	**5 % of Final Mark**
Research Thesis C:			
1.	Seminar Abstract	Week 7	**5 % of Final Mark**
2.	Research Seminar	Week 10	**10 % of Final Mark**
3.	Thesis Submission	Week 11	**70 % of Final Mark (incl. 10 % Supervisor)**

Further details of the requirements for the Abstract and Presentation will be advised by the Course Coordinator during the term.

The Research Thesis is to be submitted electronically as a single pdf by 4.00pm on Friday of the submission week via the School's student intranet at: http://intranet.civeng.unsw.edu.au/research-thesis-upload-page

Further document requirements and upload instructions are available at this site. Students are encouraged to print for themselves a hard copy of their work, and supervisors may also request that they be provide a hard copy for their records.

PROCEEDURE 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.

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).

Fail in research Thesis B & C (when taken simultaneously) – Students must re-enrol in Research Thesis B again, and cannot concurrently enrol in C. They can then take Research Thesis C when Thesis B has been satisfactorily completed

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.

RELEVANT RESOURCES

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

- 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.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at: https://student.unsw.edu.au/dates

PLAGIARISM Beware! An assessment 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

Refer to the School's student intranet 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
- CEVSOC/SURVSOC/CEPCA
- Key staff contacts: https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw

HONOURS RESEARCH THESIS A COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessment/Workshops***
1	Confirm Thesis Topic and Enrolment	**Attend Lunchtime Orientation Session**	***Course Orientation Session + Q&A*** SEE MOODLE FOR DETAILS
2	Arrange regular supervision meetings with Supervisor(s)	**Attend Lunchtime Workshop – 'How to Write a Literature Review'**	***Literature Review & Problem Statement Workshop*** SEE MOODLE FOR DETAILS
3		Work on literature review and consult with supervisor	
4		Work on literature review and consult with supervisor	
5	Prepare Draft for Component A1	Work on literature review and consult with supervisor	
6		Work on literature review and consult with supervisor	
7	Submit Component A1 – Statement of Problem and draft Literature Review	Submit to Supervisor Consult Investigation and Methodology with supervisor	***Component A1 Due – submit to your supervisor by 4pm Friday***
8	Receive review of Component A1 from supervisor	Consult Investigation and Methodology with supervisor	

9		Expand on literature review and prepare draft project skeleton Consult on your proposed Research Methodology with supervisor	
10	Submit Component A2 – more detailed, revised and improved Introduction (Statement of Problem) & Literature Review. If seeking to apply for permission to enrol concurrently in Research Thesis B + C next Term, refer to the Course Profile for further information on the additional content for A2 that is required, and the online application process.	Agree on your proposed Research Methodology with supervisor	***Component A2 Due – submit to your supervisor by 4pm Friday***

HONOURS RESEARCH THESIS B COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessment/Workshops***
1	Review and discuss of Component A2 feedback from supervisor(s)	Undertake thesis research with Supervisor(s) guidance	
2		Undertake thesis research with Supervisor(s) guidance	
3	**Thesis B+C students only**: discuss with Supervisor(s) & finalise submission B1	**Attend Lunchtime Workshop – 'Thesis Writing Workshop"**	***Thesis Writing Workshop*** SEE MOODLE FOR DETAILS ***Thesis B+C students only: Component B1 Due – submit to your supervisor by 4.00 pm Friday***
4	**Thesis B+C students only**: Receive review of Component B1 from supervisor(s)	Undertake thesis research with Supervisor(s) guidance Work on Progress Report	
5		Undertake thesis research with Supervisor(s) guidance Work on Progress Report	
6		Undertake thesis research with Supervisor(s) guidance Work on Progress Report	
7		Undertake thesis research with Supervisor(s) guidance. Work on Progress Report	
8		Finalise and submit Progress Report to supervisor(s) –including a detailed Thesis Outline (chapter and sub-headings), Research Methodology and (Preliminary) Results and Analyses	***Component B1 Due – submit to your supervisor by 4.00 pm on Friday.***
9	Receive review of Component B1 from supervisor(s)	Revise thesis. Undertake thesis research with Supervisor(s) guidance Analyse data.	
10	Complete research component (results)	Revise thesis Undertake thesis research with Supervisor(s) guidance Analyse data	

HONOURS RESEARCH THESIS C COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessments***
1		Complete remaining thesis research with Supervisor(s) guidance Analyse data	
2		Complete remaining thesis research with Supervisor(s) guidance Analyse data	
3	Complete remaining research work	Complete remaining thesis research with Supervisor(s) guidance Analyse data	
4	Complete analysis of results	Complete remaining thesis research with Supervisor(s) guidance Analyse data Work on thesis with Supervisor(s) guidance	
5		Work on thesis with Supervisor(s) guidance	
6	Prepare draft of Seminar Abstract	Work on thesis with Supervisor(s) guidance	
7	Receive supervisor feedback on Seminar Abstract	Work on thesis with Supervisor(s) guidance	***Abstract Due – submit by 4.00 pm on Friday. Course coordinator to advise on submission requirements.***
8	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance Prepare seminar/video with Supervisor(s) guidance	
9	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance Prepare seminar/video with Supervisor(s) guidance	
10	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance Prepare seminar/video with Supervisor(s) guidance	***Presentations Due (Course Coordinator to provide further details throughout the term)***
11	Complete thesis		***Thesis due – Submit on-line by 4.00 pm on Friday.***

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