School of Civil and Environmental Engineering

Term One 2022

CVEN9451/9452/9453 A/B/C Masters Coursework Thesis

COURSE DETAILS

Units of Credit	4 + 4 + 4
Contact hours	as agreed with Supervisor
Course Coordinator	**Dr Daniel O'Shea** email: d.oshea@unsw.edu.au office: Room 108 in the Civil Engineering Building (H20)

INFORMATION ABOUT THE COURSE

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

By default, students must ordinarily take Masters Thesis A, B and C in each consecutive term.

With School permission, students may request to take Masters Thesis A in the first term then Masters B + C together in the second 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 be exempted of completing a Master's Coursework Thesis if they have previously completed a recognised Thesis in their undergraduate studies or further postgraduate studies. See further details in the section on "Who is required to complete a Thesis?".

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:

https://www.handbook.unsw.edu.au/postgraduate/courses/2022/CVEN9451/
https://www.handbook.unsw.edu.au/postgraduate/courses/2022/CVEN9452/
https://www.handbook.unsw.edu.au/postgraduate/courses/2022/CVEN9453/

PROCEDURE FOR SELECTION AND CONFIRMATION OF A RESEARCH THESIS TOPIC

1. FIND A SUPERVISOR:

Option 1. If you are employed and your employer is willing to nominate a topic and co-supervise the thesis, you will have to find an academic supervisor within the school to assist with administration and assessment. This should be an academic from the appropriate discipline. Please see the link below.

http://www.engineering.unsw.edu.au/civil-engineering/academic-staff-list-a-z

Option 2. If you are not employed or your employer is not willing to nominate a topic and co-supervise the thesis, you can browse online the selection of available topics and contact potential supervisors within the school. The link is provided below (to work it needs to be cut and pasted in your browser):

https://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 strongly advised 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.

2. ORGANISE ENROLMENT:

• Discuss your selection with potential topic supervisors.

• Once you have a Supervisor and topic, your Supervisor will need to sign the Thesis Application form, which can be downloaded from this link Masters Project Thesis Form. Then upload the signed form to the Student Intranet here: https://intranet.civeng.unsw.edu.au/info-about/student-intranet/submit-thesis-application-form%20

• Please note that you will only be able to complete course enrolment for CVEN9451. The School will complete your class registration once you've submitted your topic nomination form to the Student Intranet

Note that The Nucleus are not collecting the hard copy Master Thesis application forms.

PLEASE BE AWARE THAT IF YOU CANNOT FIND A SUPERVISOR BY THE START OF TERM OF MASTERS THESIS A, THEN YOU WILL NOT BE ALLOWED TO ENROL/CONTINUE IN THE COURSE AND IT WILL BE AUTOMATICALLY DROPPED FROM YOUR ENROLMENTS. IF YOU HAVE CONTACTED THE COURSE COORDINATOR TO ASSIST YOU FINDING A SUPERVISOR, THEN YOU WILL REMAIN ENROLLED IN THE COURSE.

OBJECTIVES

The Masters Coursework Thesis Project 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 (e.g. an employer could be a co-supervisor in an external thesis project). The work may involve laboratory experiments, field or industry-based investigations, design applications or theoretical research.

The Masters Coursework 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 or a video presentation.

WHO IS REQUIRED TO COMPLETE A THESIS?

Program 8621: All students in the 8621 program must complete the thesis project in their final year of study (or alternatively enrol in CVEN9050/9051 (Masters Practice Project).

Program 8338: All students in the 8338 program must complete the thesis project in their final year of study (or alternatively enrol in CVEN9050/9051 (Masters Practice Project). Students who have not completed a recognised Thesis in their undergraduate studies or further postgraduate studies are required to complete a Thesis in their Masters Coursework program. If you are unsure if you have completed one, please contact The Nucleus so an assessment can be made on whether you are eligible for thesis exemption or advanced standing.

WHAT IS A MASTERS COURSEWORK THESIS?

That depends quite a bit on your field of study. However, all 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***
  A 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 Masters Coursework Thesis Project 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

At the conclusion of this course, students should be able to:
• Develop a design or a process, or investigate a hypothesis, following industry and professional engineering standards.
• Critically reflect on a specialist body of knowledge related to their thesis topic.
• Apply scientific and engineering methods to solve an engineering problem.
• Analyse data objectively using quantitative and mathematical methods.
• Demonstrate oral and written communication in professional and lay domains.

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

ASSESSMENT – KEY DATES FOR YOUR DIARY

Masters 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.

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

Masters 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.

In the event of an unsatisfactory assessment in Masters Thesis A or Masters 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 Masters Thesis B or Masters 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.

MASTERS 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), Literature Review.

  NOTE: If students are seeking to apply for permission to enrol concurrently in Research Thesis B + C in the following Trimester, then the additional requirement is that the A2 submission must also include a Thesis Outline (chapters and indicative sub-headings) plus a description of Research Methodology.

- **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.

MASTERS 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.

MASTERS THESIS C SUBMISSIONS

1.	Seminar Abstract	Week 7	**5 % of Final Mark**
2.	Research Seminar/Video Presentation	Week 10	**10 % of Final Mark**
3.	Thesis Submission	Week 11	**70 % of Final Mar**k

SUMMARY OF 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: 3)	**5 % of Final Mark**

Research Thesis C:

1. Seminar Abstract	Week 7	**5 % of Final Mark**
2. Research Seminar/Video Presentation	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 Masters Thesis is to be submitted electronically as a single pdf by 4.00pm on Friday of the submission week via the School's web portal at: https://intranet.civeng.unsw.edu.au/research-thesis-upload-page

Further document requirements and upload instructions are available at this site. If you are conducting a thesis based at an employer, you are required to provide them with a copy of your thesis in Week 11.

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 enrol in a 4+8 UoC structure, where Master Thesis B and C are both taken in the same term after Research Thesis A.

Students should submit their request to undertake Master 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 Master Thesis A may be instructed to change enrolment and complete Master Thesis C in a third term after Master Thesis B.

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).

Fail in Thesis B & C (when taken simultaneously) – Students must re-enrol in Thesis B again, and cannot concurrently enrol in C. They can then take 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 should apply through myUNSW for special consideration.

Further information on what constitutes special consideration, and how to apply for it, can be found at this website:

https://student.unsw.edu.au/special-consideration

LATE PENALTIES (when special consideration hasn't been submitted and accepted)

- 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

The online reference provided below is directed at final year Honours undergraduate students. However, for all practical purposes, there are many similarities in the academic expectations of Honours and Masters by Coursework theses. Furthermore, students are encouraged to utilise the excellent resources at the UNSW Learning Centre during their thesis research.

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

UNSW Learning Centre: https://student.unsw.edu.au/individual-consultations-academic-support

- 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. 1996.

HEALTH & SAFETY

UNSW is committed to the health and safety of all people who work, study, visit UNSW campuses. Health and safety are intrinsic to the way UNSW does business and UNSWs overall aim is "Harm to Zero", with the expectation that no person shall come to any harm while working, studying or visiting UNSW.

UNSW will comply with the NSW Work Health and Safety Act 2011 and the Work Health and Safety Regulation 2011.

Details about UNSW Health and Safety commitment are available online:
https://safety.unsw.edu.au/unsw-health-and-safety-policy-statement

and comprehensive information about UNSW's Health and Safety can be found on:

http://safety.unsw.edu.au/
Student requirements, training and responsibilities

As a student undertaking a Masters' coursework thesis you are often undertaking experimental works in laboratories, attending data collection in the field or participating in community consultations. Independent of your thesis topic, the expectation is that you adhere to the UNSW Health & Safety policies.

Every Masters' coursework student must complete online safety training at the beginning of Masters' Project A by the end of Week 2.

All students have to complete the following online training:
- On-Line Work Health & Safety Awareness
- On-Line Ergonomics

Students working in the laboratory also have to complete:
- On-Line Laboratory Safety Awareness
- On-Line Green Lab Environment Compliance

There are additional courses for students who work with radiation or gene technology or in a PC2 Laboratory. It is the responsibility of the student to self-enrol into these courses via this webpage: http://safety.unsw.edu.au/Training/student-training

In addition to the online courses, every student must complete a local induction (RIPA Folder) with the laboratory manager of the laboratory they are working in. Anyone working in WRL laboratories can organise their local induction with their Supervisor.

In meetings with their Supervisor, students will be informed about their project specific Risk Assessments, Risk Management Forms and Safe Work Procedures. It is the responsibility of the student to engage in this discussion with their Supervisor and to follow Health & Safety requirements and expectations.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

https://student.unsw.edu.au/dates

PLAGIARISM

Beware, ignorance is not a satisfactory excuse for plagiarism! Ensure you know what plagiarism consists of because 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

Useful information and resources:

- 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
- 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

MASTERS RESEARCH THESIS A COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessment/Workshops***
1	Confirm Thesis Topic and Enrolment	**Attend Lunchtime Orientation Session**	**Orientation Session + Q&A** Date/time: Monday 14/02/2022 at 11.00am – 12.00 pm. Venue: CE701 (F2F) or Live Stream (see Moodle for details)
2	Arrange regular supervision meetings with Supervisor(s) Complete mandatory student health and safety training	**Attend Lunchtime Workshop – 'How to Write a Literature Review"**	**Literature Review & Problem Statement Workshop** Date/time: Monday 21/02/2022 at 11.00am – 12 pm Venue: CE701 (F2F) or Live Stream (see Moodle for details)
3		Work on statement of the problem and literature review with Supervisor	
4		Work on statement of the problem and literature review with Supervisor	CENSUS DATE: 27/02/2022, 11.59pm
5	Prepare Draft for Component A1	Work on statement of the problem and literature review with Supervisor	
6		Work on statement of the problem and literature review with Supervisor	
7	Submit Component A1 – Statement of Problem and draft Literature Review	Finalise and submit Statement of the Problem and Literature Review to Supervisor (s)	***Component A1 Due – submit to your Supervisor by 4.00 pm on Friday***
8	Receive review of Component A1 from Supervisor (s)	Revise Statement of the Problem and Literature Review. Consult on your proposed Research Methodology with Supervisor.	
9	Complete additional student health and safety training	Revise Statement of the Problem and literature review and prepare draft project skeleton. Consult on your proposed Research Methodology with Supervisor.	
10		Finalise Research Plan and Methodology for Thesis B with Supervisor.	***Component A2 Due – submit to your Supervisor by 4.00 pm on Friday***

If students are seeking to apply for permission to enrol concurrently in Masters Thesis B + C in the following Term, then the additional requirement is that the A2 submission must also include a Thesis Outline (Chapters and indicative sub-headings) plus a description of Research Methodology.

MASTERS RESEARCH THESIS B COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessment/Workshops***
1	Receive review of Component A2 from Supervisor (s)	Undertake thesis research with Supervisor(s) guidance.	
2		Undertake thesis research with Supervisor(s) guidance.	
3		Attend Lunchtime Workshop – 'Thesis Writing Workshop"	**Thesis Writing Workshop,** Date/time: Monday 28/02/2022 at 11.00am – 12 pm Venue: CE701 (F2F) or Live Stream (see Moodle for details) Thesis B+C students: Component B1 Due – submit to your Supervisor by 4.00 pm on Friday
4	**Thesis B+C students:** Receive review of Component B1 from Supervisor (s)	Undertake thesis research with Supervisor(s) guidance. Work on Progress Report.	CENSUS DATE: 27/02/2022, 11.59pm
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.	

MASTERS RESEARCH THESIS C COURSE PROGRAM

Week	***Milestones***	***Suggested Activities***	***Assessment/Workshops***
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.	CENSUS DATE: 27/02/2022, 11.59pm
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.	***Seminar Abstract Due – submit by 4.00 pm on Friday. See Moodle for submission requirements.***
8	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance. Prepare seminar with Supervisor(s) guidance.	
9	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance. Prepare seminar with Supervisor(s) guidance.	
10	Receive supervisor feedback on thesis	Work on thesis with Supervisor(s) guidance. Prepare seminar with Supervisor(s) guidance.	***Presentations Due – submit by 4.00 pm on Friday. See Moodle for submission requirements.***
11	Complete thesis		***Thesis due – Submit on-line by 4.00 pm on Friday. See Moodle for submission requirements.***

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