School of Chemical Engineering

UNSW Engineering

CEIC4951, CEIC9951

Research Thesis A

Term 1, 2023

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Peter Neal	peter.neal@unsw.edu.au	Tue, 4-5 pm via the Thesis Office Hours meeting in Teams	Room 216, Hilmer Building (E10) – across the bridge from Level 2, SEB (E8)	+61-(0)2-9 385-4814

School Contact Information

For assistance with enrolment, class registration, progression checks and other administrative matters, please see the Nucleus: Student Hub. They are located inside the Library – first right as you enter the main library entrance. You can also contact them via http://unsw.to/webforms or reserve a place in the face-to-face queue using the UniVerse app.

If circumstances outside your control impact on submitting assessments, Special Consideration may be granted, usually in the form of an extension or a supplementary assessment. Applications for Special Consideration must be submitted online.

For course administration matters, please contact the Course Coordinator.

Questions about the this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.

Course Details

Units of Credit 4

Summary of the Course

Research Thesis is an inquiry-based learning course that provides an opportunity for students to bring together engineering principles learned through academic study and professional experience. Students apply these principles to innovatively solve problems such as the development of a specific design, process and/or the investigation of a hypothesis. Students taking Advanced Research Thesis are expected to demonstrate these qualities at an advanced level.

The project a student undertakes must be a complex, open-ended problem that allows room for 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.

You must identify a supervisor and project prior to enrolling in this course.

This is the first course of the three course research thesis sequence.

Course Aims

The aim of this course is that students to become critically conversant in the academic and professional literature on a particular topic, formulate problems in technical terms, manage an extended project and find solutions by applying engineering and/or scientific methods. Students are also expected to explain how their project fits within the discipline and broader societal context. Finally, students demonstrate their ability to autonomously 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.	PE2.3, PE2.4, PE1.3, PE1.4, PE1.5, PE3.1, PE3.2
2. Critically reflect on a specialist body of knowledge related to their thesis topic.	PE1.4, PE3.4
3. Apply scientific and engineering methods to solve an engineering or food science problem.	PE2.1, PE2.2, PE3.4
4. Analyse data objectively using quantitative and mathematical methods.	PE1.2, PE2.1, PE2.2, PE1.1
5. Demonstrate oral and written communication in professional and lay domains.	PE3.2, PE3.5

Professional Recognition of Course

CEIC4951 is part of the UNSW Food Science specialisations approved (2021-2026) by the Institute of Food Technologists Higher Education Review Board (IFT HERB).

Relationship with the rest of your program and the discipline

Research Thesis is a capstone course which requires you to employ knowledge and skills developed throughout the rest of your studies. The degree to which you rely on the knowledge from any one course will depend on your project. For example, thesis projects may involve you using your knowledge of chemistry and thermodynamics, your design and process modelling capabilities, or your skills in lifelong learning to develop expertise outside of your regular coursework.

All projects will require you to employ the professional skills you have developed. Good oral and written communication skills will be expected, not only for your assessments but also for the day-to-day activities like meetings and lab work. Teamwork skills are also essential as you work with your supervisor, other researchers, and technical staff.

Beyond university, Thesis provides you with an opportunity to demonstrate to professional bodies and potential employers that you can research and propose solutions to a significant problem, manage large open-ended projects, and communicate your findings in a professional manner.

Teaching Strategies

This is an experiential, enquiry-based learning course structured around single long-form open-ended project. Therefore, main learning activity is self-directed study or project work, at your own speed, under the guidance of your supervisor(s). In Thesis A, this will involve conceptually orienting yourself to your project, reading and critiquing relevant literature, applying project management principles to plan our your project, and communicating your thinking in the written form. Project-independent supporting materials including how-to guides are made available online.

The main source of feedback in this course is the regular meetings you have with your supervisor. These meetings are a great time to seek advice on project directions, get help with things you don't understand, brainstorm/debug issues that you're having, and have your progress evaluated. You should arrange regular weekly or fortnightly meetings with your project supervisor or co-supervisor. These meetings may be in person or online.

Finally, research is a always collaborative exercise. This is primarily found in your interactions with your supervisor(s) and the literature, but projects may also involve group discussions and collaborative work. It is important to engage with and use these activities for learning. However, as thesis is ultimately an individual project, your project deliverables should focus on your ideas and your work, and explicitly acknowledge the contributions of others.

Additional Course Information

Integrity and Respect

The UNSW Student Code of Conduct among other things, expects all students to demonstrate integrity in all their academic work, and to treat all staff, students and visitors to the University with courtesy, tolerance and respect.

In line with the comments at the end of this outline (see "Academic Honesty and Plagiarism"), generative

AI systems (e.g. ChatGPT) are tools that all graduates should learn how to use responsibly and ethically. It can be a helpful partner for brainstorming, quickly helping you develop some starting points. It can be a patient (and usually reliable) tutor, explaining complex theory in simple terms. Like Wikipedia, it can be a helpful starting point, but it's not where you should finish.

Regardless of how apparently knowledgeable or verbose the system may be, it can't do the work for you. You will need to personally explain your work and your ideas throughout your thesis course in both formal and informal contexts. Thus, you need to know what you're doing and so you must not use a bot to write large portions your work. This is akin to relying too much on the words of others and is a form of plagiarism.

If you make use of text or other generative tools in the conduct of your thesis project, then you must

1. Ensure your supervisor is aware that you are using these tools for thesis work.
2. Formally and specifically acknowledge how you used it in your thesis submissions in
    - Your Acknowledgements section (in the same way as you would acknowledge the contribution of others to your project) and/or
    - The appropriate part of your work (e.g. Method or Results).
3. Cite the tool (like any other reference source) if you use ideas or text it generated (e.g., OpenAI. (2023). ChatGPT. OpenAI. https://beta.openai.com/docs/models/gpt-3).
4. Include the full response of the AI in an appendix and discuss that response in the body of the document.

Further, as research course students, you are also expected to compy with the UNSW Research Code of Conduct, particulary the Principles of the Responsible Conduct of Research and Responsibilities of UNSW Researchers outlined in the code, as well as the University's Human Research Ethics and/or Animal Research Ethics Procedures. For more information visit the UNSW Research Integrity Policies and Procedures page.

Time commitment

CEIC4951 is a 4 UOC course and has no final exam, therefore you are expected to spend a minimum of 100 hours (or 10 hours per week during term) to complete the requirements of this course. While CEIC9951 is a 6 UOC course and so the demands on your time are correspondingly higher – 150 hours over the term or 15 hours per week. Most of this time will be spent in independent study or training.

Competence

Thesis is a capstone course and you are expected to be competent in all the material covered in the previous courses. Little time is available to remediate deficiencies in your knowledge.

Over the course of the term, you will be developing new competencies. The standards we expect, are explained by the marking rubrics provided. Your supervisor will apply these marking guides fairly and provide you with feedback so you can continue to improve over the three thesis courses.

Participation

You are expected to contact your project supervisor early and maintain contact regularly to carry out a suitable project. This would typically involve face-to-face meetings, but also includes email and other electronic means. Allow at least an hour per week for these activities.

You are expected to be proactive in identifying and completing any project dependent preparations including workplace health and safety requirements, and any training or access requirements. You should also be proactive in seeking feedback on your progress from your supervisor. The degree to which you take initiative and engage with your project work will be assessed in each thesis course.

You are encouraged to use the "Course QandA" channel on Teams to discuss challenges faced through this course, ask questions about course content, discuss solutions to tutorial and practice questions. It is expected that students will help each other, and the coordinator will contribute as required. You may also seek live help during the weekly office hours sessions.

Further, as senior students you are expected to be able to work effectively on your own. This includes seeking our help with your project from your supervisor, lab manager or other people involved in the supervision of your project or the course.

Attendance and punctuality

We expect students to be punctual and attend at all scheduled meetings with the coordinator, your supervisor, or their team. If you are unable to attend a pre-arranged meeting, observe normal professional courtesies and inform the parties involved ASAP.

Assessment

Your final grade for Thesis A, B & C will be the weighted average of all assessments across all three courses:

- Thesis A
    1. Project Supervision (SY/FL) – Friday, Week 1
    2. Project Specification (SY/FL) – Friday, Week 3
    3. Draft Literature Review (SY/FL) – Monday, Week 7
    4. Literature Review (10%) – Monday, Week 9
    5. Project Plan (5%) – Monday, Week 11
- Thesis B
    1. Thesis progress check-in (SY/FL) – Friday, Week 3*
    2. Progress Seminar (5%) – By arrangement with supervisor.
    3. Progress Reflection (5%) – Monday, Week 11 (Thesis B only), or Friday, Week 3 (Thesis B and C together)
    4. Supervisor's Report B (5%) – No submission required
- Thesis C
    1. Thesis progress check-in (SY/FL) – Friday, Week 3*
    2. Presentation and Q&A (5%) – Thursday, Week 10 and Monday, Week 11 (respectively)
    3. Final Report and supporting files (60%) – Friday, Week 11
    4. Supervisor's Report C (5%) – No submission required

* Students taking Thesis B and C together do not complete this task.

Course grades and progression

If you satisfactorily complete the requirements of Thesis A, you will receive an EC grade (enrollment continuing) and will be allowed to continue to Thesis B. In the same way, satisfactory completion of Thesis B (EC grade) will enable progression to Thesis C. Students who make excellent progress in Thesis A, may be allowed to enrol in Thesis B and C at the same time (accelerated study mode).

If you do not complete any assessment tasks (beyond securing a supervisor), you will receive an AF grade and must repeat this course. If you complete one or more assessment items and still fail to satisfy the course requirements, you will receive an FL and must repeat this course. Students that fail a thesis course (AF or FL) may be asked by their supervisor (or the course coordinator) to change projects or find another supervisor, this may require the student to begin again at Thesis A.

If you receive an LE grade, it means that marks are missing for one or more of your assessments. You can check which marks are missing in the Moodle gradebook. When all the missing marks are received, we will forward your grade (either EC or FL) to Student Services for processing.

Upon completion of Thesis C, your marks from all three courses will be aggregated into a single thesis mark and retrospectively applied to all three courses (replacing the EC grades).

The Student Gateway provides more details on the UNSW grading system and assessment.

List of assessment tasks in CEIC4951 and CEIC9951

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Project Supervision	N/A	5pm Friday, Week 1	1
2. Project Specification	N/A	5pm Friday, Week 3	1, 2
3. Draft Literature Review (Smarthinking feedback)	N/A	9pm Monday, Week 7	5
4. Literature Review	10%	9pm Monday, Week 9	1, 2, 4, 5
5. Project Plan	5%	9pm Monday, Week 11	1, 2, 3, 4, 5
6. Thesis B	15%	Not Applicable	1, 2, 3, 4, 5
7. Thesis C	70%	Not Applicable	1, 2, 3, 4, 5

Assessment 1: Project Supervision

Start date: Prior to enrolment
Submission notes: Submit an Expression of Interest via the link on the course Moodle page.
Due date: 5pm Friday, Week 1

You **must** have a supervisor from the School of Chemical Engineering to take this course, regardless of whether the project is hosted at UNSW or with an external party.

Information about how to secure a supervisor is available on the course Moodle page and on the Research Thesis Projects page (enrollment code co3shyh). Students will indicate their interest in being supervised by a particular person via the Expression of Interest form (see Step 3). This page also provides useful background about Research Thesis (see Step 1), lists of potential supervisors and projects (see Step 2), as well as information on different study patterns (see Step 4).

Once you have secured a supervisor, arrange a project kick-off meeting with them (normally in O-Week or Week 1). At this meeting you should discuss your project topic, who you will be working with, and how you will communicate, as well as arranging regular weekly/fortnightly meetings.

Assessment 2: Project Specification

Submission notes: You must have completed all the Research Skills lessons before you will be able to access the Project Specification form. This task will be submitted using a Microsoft Form accessable via the link on Moodle.
Due date: 5pm Friday, Week 3

Students submit a brief statement of the research question to be investigated by their project. This statement may be based on a project brief supplied by the supervisor but should involve the student contextualising and developing their own initial view of the issues at hand. Some other project-specific information is also collected at this time - students should discuss the answers to these questions with their supervisor.

The specification will be reviewed by the student's supervisor and must be resubmitted until a grade of Satisfactory is achieved.

Assessment 3: Draft Literature Review (Smarthinking feedback)

Assessment length: Up to 4,500 words
Submission notes: This task will be submitted via the dedicated Assignment activity on Moodle.
Due date: 9pm Monday, Week 7

Students submit a draft of their Literature Review (max. 4,500 words) to the Smarthinking service for feedback. It takes up to 24 hours to receive written feedback from Smarthinking, so at least 36h should be allowed before the overall due date.

Students then submit a copy of their draft, together with the feedback from Smarthinking in Moodle by the due date.

Assessment 4: Literature Review

Assessment length: 6,000 words
Submission notes: This task will be submitted on Moodle via the dedicated Workshop tool.
Due date: 9pm Monday, Week 9

After setting the project in context, students conduct a critical review of the pertinent literature, thereby identifying gaps in knowledge &/or capability in the field. This analysis and evaluation leads to the formulation of a problem statement for their project.

Students should submit two versions of their final Literature Review:

1. A Microsoft Word document, and
2. The Turnitin Similarity Report as a PDF file.

The review will be marked by the student's supervisor using a standard rubric with comments returned to the student.

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

Assessment criteria

This task will be assessed using the following rubric.

Level	Deficient	Adequate	Proficient	Good	Outstanding	Exceptional
CEIC4951 bands	0-9	10-13	13-15	15-17	17-19	20
CEIC9951 bands	0-7	8-11	11-13	13-15	15-17	17-20
Critically reviewing the literature (75%)	May be characterised by several features, including: (1) inappropriate reliance on n	Enough literature reviewed to inform the proposed research, although it is	Covers most significant areas of relevant literature. There is some	Covers all significant areas related to the project. There is evaluation of	Demonstrates a cohesive understanding of the topic area as well as comprehensively	Demonstrates a exceptional mastery of the topic area, creatively

Level	Deficient	Adequate	Proficient	Good	Outstanding	Exceptional
CEIC4951 bands	0-9	10-13	13-15	15-17	17-19	20
CEIC9951 bands	0-7	8-11	11-13	13-15	15-17	17-20
	on-academic /technical literature, (2) not reviewing core literature for their topic, &/or (3) not reviewing any recent work.	too shallow and/or narrow for the final thesis – further review will be required. The review is mainly description of what has been done and/or summarises current knowledge.	evaluation of the arguments and evidence presented in the literature. There is some attempt at integrating knowledge from a variety of works into a cohesive und erstanding.	the evidence and arguments presented in the literature throughout the review. The student integrates knowledge from a variety of works into an interconnect ed view of their topic.	incorporating knowledge from wide-ranging survey of the literature. The review is marked extensive critical reflection and integration of the arguments and evidence presented in the literature.	integrating insights from a diverse and wide-ranging survey of the literature. The review is marked by a sophisticated reflection and synthesis of the arguments and evidence presented in the literature.
Contextualisi ng and defining the problem to be solved (15%)	The student has done a poor job of explaining the context and background to the reader. A problem statement or research question is absent, not open-ended or is simply a general statement of the research topic.	The student demonstrate s an sound u nderstanding of the importance of their project. They set the project within a narrow, research context. At least one gap in the literature is identified. An open-ended problem statement (or research question) is provided but	The student demonstrate s a solid und erstanding of some relevant factors driving their project. They establish the significance of their topic within a discipline, industrial, or societal context. Several gaps in the literature are identified. An open-ended problem	The student demonstrate s a thorough understandin g of the relevant factors driving their project. They establish the significance of their topic within the discipline, and an industrial or societal context. A discussion of several gaps in the literature leads to a	The student demonstrate s an extensive un derstanding of the factors influencing the project. They establish the significance of their topic within the discipline, and an industrial or societal context, and reflects on how the topic affects several stakeholders .	The student demonstrate s a exceptional u nderstanding of the factors influencing the project. The significance of the topic is established within both the discipline and broader i ndustrial-societal context, showing insight into how the topic affects a variety of stakeholders

Level	Deficient	Adequate	Proficient	Good	Outstanding	Exceptional
CEIC4951 bands	0-9	10-13	13-15	15-17	17-19	20
CEIC9951 bands	0-7	8-11	11-13	13-15	15-17	17-20
		it is not clear how it is related to the gap analysis.	statement (or research question) that clearly addresses at least one gap identified in the literature review.	focused, open-ended problem statement (or research question) that clearly addresses one or more of the gaps identified in the literature review.	A detailed gap analysis leads to an open-ended, focused, and problem statement (or research question) that clearly addresses multiple gaps identified in the literature review.	. A detailed gap analysis leads to an open-ended, focused, and novel problem statement (or research question) that clearly addresses multiple gaps identified in the literature review.
Communication (10%)	The document is poorly structured, does not cohere or shows a lack of understanding of the purpose of its sections. Much effort is required to read and understand the report: writing is poor, many mistakes with spelling and grammar, and possibly inappropriate langue style	Document is not at a professional level but does make use of headings and sub-headings to indicate document structure. The report is may be difficult to read: writing is just OK, broad idea comes across; spelling and grammar have some flaws, not quite	The document makes some use headings and other stylistic conventions to indicate document structure. The report is reasonably easy to read: there may be some issues with spelling, grammar or style but doesn't affect comprehension. Figures and diagrams are	The document makes good use headings, sub-headings and other stylistic conventions to indicate document structure. The report is easy to read: writing is clear enough, with good spelling and grammar, and reasonable choice of language	The document follows a clear and logical structure indicated using headings and other conventions. The report is very easy to read: well-written, with good spelling and grammar, and appropriate language style. Text spacing aids	The document is written at the standard of a professionally edited piece, with an polished structure, exemplary formatting, engaging to read, and no spelling or grammatical errors. Sophisticatred presentation of graphical and tabular data. References in text match

Level	Deficient	Adequate	Proficient	Good	Outstanding	Exceptional
CEIC4951 bands	0-9	10-13	13-15	15-17	17-19	20
CEIC9951 bands	0-7	8-11	11-13	13-15	15-17	17-20
	(e.g. too informal) Presentation is poor to the extent that it impedes reading of the document. Examples include inconsistent formatting, and unlabelled figures or tables. References are either not cited or cited inconsistentl y.	appropriate language style. Although figures and tables are labelled, the formatting is unclear and/or inconsistent to the extent that the reader can lose track of the context when reading. References in text match reference list (and vice versa) and are mostly cited correctly.	generally fine, although there may be some issues with the presentation of data - poor choice of axes, overcrowdin g, etc. References in text match reference list (and vice versa) and are cited properly.	style. Graphical elements (figures, tables, etc.) are labelled, largely formatted consistently and cited correctly. References in text match reference list (and vice versa) and are cited properly.	readability. All aspects of formatting are consistent throughout the document. Graphical and tabular presentation of data is appropriate, clear, consistent and economical. References in text match reference list (and vice versa) and are cited properly.	reference list (and vice versa) and are cited properly.

Assessment 5: Project Plan

Assessment length: 2,500 words
Submission notes: This task will be submitted on Moodle via the dedicated Workshop tool.
Due date: 9pm Monday, Week 11

The plan should commence with the aims and scope that define how the problem statement developed in the Literature Review task will be solved or addressed. Students then explain the design and structure of the project, including the methodology, analysis, and data management to be used. The plan also includes a timeline with clear milestones along with some consideration of project risks. Students will also be assessed on their initiative, engagement, and the maturity of their project preparations. Project dependent preparations may include training on specific equipment, software, or methodologies; preliminary results or designs; the ordering of components, parts or reagents; risk management and

access approvals; or ethics approvals.

Students should submit two versions of their Project Plan:

1. A Microsoft Word document, and
2. The Turnitin Similarity Report as a PDF file.

The plan will be marked by the student's supervisor using a standard rubric with comments returned to the student.

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

Assessment criteria

This task will be assessed using the following rubric.

Level	Deficient	Adequate	Proficient	Good	Outstanding
Mark bands	0-9	10-13	13-15	15-17	17-20
Aims (10%)	Project aims are unclear or inappropriate. Any hypotheses proposed unlikely to be answered by the proposed methodology.	Project aims stated are clear but general. Any hypotheses proposed are related to the proposed methodology.	Project aims stated are clear and focused. Any hypotheses proposed are specific and related to the proposed methodology.	Project aims stated are clear, focused, and achievable within the scope of the thesis project. Any hypotheses proposed are specific and are clearly addressed by the proposed methodology.	Project aims stated are clear, focused, and achievable, defining an innovative scope for the thesis project. Any hypotheses proposed are specific and clearly testable by the proposed methodology.
Planning (30%)	The research plan is not present, does not have sufficient detail to demonstrate what the project would deliver, or defines a project that does not meet the expectations of	There is enough of a plan to believe that the research project is feasible, however it lacks detail and justification from the literature. The proposed	The research plan includes some detail in terms of methodology, work to be completed and outcomes delivered. There is limited justification from the literature.	The research plan outlines a set of the milestones and project components. The plan is clearly informed by the literature. The timeline is realistic and may exhibit a	The research plan explains a logical, discrete set milestones & project components (design, methodology, analysis and data management). A rigorous, liter ature-informed case is made

Level	Deficient	Adequate	Proficient	Good	Outstanding
Mark bands	0-9	10-13	13-15	15-17	17-20
	a thesis project. The timeline is not present or does not demonstrate how the student would successfully complete a thesis project. Little attempt has been made to describe how the project would be managed.	timeline is not detailed &/or consists of generic activities with little explanation of what they are intended to achieve. Little consideration is given to what will be required to make the project happen.	The timeline is realistic, but mainly follows a linear approach. Enough detail to believe the research project is feasible. The plan includes some provision for project variations and contingencies. The plan shows some understanding of the resources, training &/or permitting required.	multistrand approach. Enough detail to believe the research project is feasible, with some provision for project variations and contingencies. Some key resources, training &/or permitting required have been identified and documented as appendices.	for methods to be employed. The timeline is realistic and robust, with good consideration of project management; risk mitigation strategies proposed. All key resources, training and permitting identified and documented as appendices.
Maturity (30%)	Very little preparatory work has been completed, perhaps completed laboratory inductions, or observed some introductory demonstrations only. Student will need to do significant catching up before the start of Thesis B.	Some preparatory work completed on research project, but it does not look like one session's worth of effort. Student will need to do some catching up before or at the start of Thesis B.	Preparatory work mostly complete and project appears to be at a stage where it can be completed over two terms.	All project preparations have been completed and the student will be able to begin executing their research plan as soon as they commence Thesis B. Some initial results may have been generated.	Preliminary work all completed and well into the research component of the project. Real progress made with results already being generated.
Initiative and engagement (20%)	Irregular, sporadic engagement in the project. The student needed a lot of pushing	Regular engagement but only just adequate. The student showed some	Consistent engagement. Clear evidence of student driving the project (e.g.	High level of sustained engagement throughout the whole term. Student	Superior evidence of engagement. The student is intellectually and practically

Level	Deficient	Adequate	Proficient	Good	Outstanding
Mark bands	0-9	10-13	13-15	15-17	17-20
	from supervisor to make things happen	evidence of driving the project but considerable need for improvement.	prepared questions/agendas for meetings, proactive approach to developing the review/plan).	initiated many own ideas during the process.	driving the project, going beyond what is generally expected of a coursework student.
Communication (10%)	The document is poorly structured, does not cohere or shows a lack of understanding of the purpose of its sections. Much effort is required to read and understand the report: writing is poor, many mistakes with spelling and grammar, and possibly inappropriate langue style (e.g. too informal) Presentation is poor to the extent that it impedes reading of the document. Examples include inconsistent formatting, and unlabelled figures or tables. References are	Document is not at a professional level but does make use of headings and sub-headings to indicate document structure. The report is may be difficult to read: writing is just OK, broad idea comes across; spelling and grammar have some flaws, not quite appropriate language style. Although figures and tables are labelled, the formatting is unclear and/or inconsistent to the extent that the reader can lose track of the context when reading. References in text match reference list	The document makes some use headings and other stylistic conventions to indicate document structure. The report is reasonably easy to read: there may be some issues with spelling, grammar or style but does not affect comprehension. Figures and diagrams are generally fine, although there may be some issues with the presentation of data - poor choice of axes, overcrowding, etc. References in text match reference list (and vice versa) and are cited properly.	The document makes good use headings, sub-headings, and other stylistic conventions to indicate document structure. The report is easy to read: writing is clear enough, with good spelling and grammar, and reasonable choice of language style. Graphical elements (figures, tables, etc.) are labelled, largely formatted consistently, and cited correctly. References in text match reference list (and vice versa) and are cited properly.	The document follows a clear and logical structure indicated using headings and other conventions. The report is very easy to read: well-written, with good spelling and grammar, and appropriate language style. Text spacing aids readability. All aspects of formatting are consistent throughout the document. Graphical and tabular presentation of data is appropriate, clear, consistent, and economical. References in text match reference list (and vice versa) and are

Level	Deficient	Adequate	Proficient	Good	Outstanding
Mark bands	0-9	10-13	13-15	15-17	17-20
	either not cited or cited inconsistently.	(and vice versa) and are mostly cited correctly.			cited properly.

Assessment 6: Thesis B

Details of the current Thesis B assessments (listed above) are provided in this term's course outline. The assessments may be different in the term you take Thesis B.

Assessment 7: Thesis C

Details of the current Thesis C assessments (listed above) are provided in this term's course outline. The assessments may be different in the term you take Thesis C.

Attendance Requirements

Students are expected to attend all scheduled meetings with supervisors, and if applicable, co-supervisors and research groups. Students in Thesis A should also be setting aside significant time each week to complete their deliverables and project-dependent preparations. This preparation may include training on specific equipment, software, or methodologies; preliminary results or designs; the ordering of components, parts or reagents; risk management and access approvals; or ethics approvals.

Course Schedule

Thesis is a research-based course and does not have any regularly scheduled classes. There is an important "Getting Started with Thesis" session at 2pm on the Friday of O-Week. You can ask questions ahead of this session via the Anonymous Questions tab in the Course Forum. If you are unable to attend, you should watch the recording available from the course Moodle page.

There is also a weekly Thesis Office Hours session at 4-5pm on Tuesdays with the Course Coordinator. This is an optional online consultation time with no fixed agenda. Join if you want help with anything about this course and its assessments - questions may also be posted anonymously via the Anonymous Questions tab in the Course Forum . Project specific questions should be directed to your supervisor.

View class timetable

Timetable

Date	Type	Content
Week 1: 13 February - 17 February	Assessment	**Project Supervision -** If you have not already done so, secure a supervisor by following the process outlined on Moodle. You should have completed this process by 5pm on Friday, otherwise you should consider starting Thesis A in a later term (when you have secured a supervisor).
	Project	**Project Kick-Off Meeting -** If you have not already done so, arrange a meeting with your supervisor(s) this week. Make sure to discuss your project topic, initial project work, who you will be working with and how you will communicate with them. You should also ask it your project work will be subject to any confidentially and/or intellectual property arrangements. Finally, arrange your regular weekly or fortnightly meetings with your supervisor(s). Following the meeting, write down your current thoughts on what your project is about and it's intended outcomes. Start working through the **Research Skills Lessons** on Moodle. This week you should complete at least the lessons *Introduction to*

		Research, and *Searching, Reading and Managing the Literature*. Work through the tasks outline at the end of the lessons. You should also start work on the reading and other tasks you discussed with your supervisor. **Application for Distance Thesis Study** **-** Students conducting their project with an external organisation and/or outside of the Greater Sydney area, must get approval for distance thesis study from the Thesis Coordinator. Complete the Application for Distance Thesis Study form (available on Moodle) using the information gained from your Kick-Off Meeting, and then send it to your supervisor(s) for their (electronic) signature. Once they've signed it, submit your application using the link on Moodle. You will be notified by email once it is approved.
Week 2: 20 February - 24 February	Project	Continue with the project work recommended by your supervisor(s), and attend any supervisor or research group meetings they have arranged with you. If you haven't already done so, discuss confidentially and intellectual property arrangements with your supervisor(s), as well as what Workplace Health & Safety requirements you will need to fulfil. Continue working through the **Research Skills Lessons** on Moodle. If you haven't already done so, you should aim to complete the lessons *Researching Safely*, and *Writing Critical Reviews*. Work through the tasks outline at the end of the lessons. Draft a 50-100 word **problem statement** that outlines the research question who will be investigating in your project and share it with your supervisor(s). If you need approval for **Distance Thesis Study** and haven't already done so, submit your completed and signed application using the link on Moodle.
Week 3: 27 February - 3 March	Project	Attend any supervisor or research group meetings they have arranged with you, and

		continue with the project work recommended by your supervisor(s). If you haven't already done so, • discuss your draft project statement with your supervisor(s) ahead of the Project Specification deadline on Friday, and • complete all the **Research Skills Lessons** on Moodle (you won't be able to submit your Project Specification until you have done this).
	Assessment	**Project Specification** Submit your project specification by 5pm, Friday.
Week 4: 6 March - 10 March	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). Aim to write at least a 50-100 summary of every paper you read using the active reading skills in the *Writing Critical Reviews* lesson. Identify what WHS training courses you will need to complete before commencing your project work in Thesis B.
Week 5: 13 March - 17 March	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). If you haven't already done so, start writing your Literature Review. You might find it helpful to (1) revise the lesson on *Writing Critical Reviews*, and (2) construct a mind map or an annotated table of contents of topics related to your thesis project . Register for any WHS training courses you will need to complete before commencing your project work in Thesis B.
Week 6: 20 March - 24 March	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). You should be well into the writing of your Literature Review. Share your current draft with

		your supervisor ahead of your meeting and incorporate their feedback, before sending your Draft Literature Review to Smarthinking on Friday or Saturday.
Week 7: 27 March - 31 March	Assessment	**Draft Literature Review** Submit the feedback you received from Smarthinking along with a current draft of your Literature Review by 9pm, Monday.
	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). Continue revising and expanding your Literature Review based on feedback from Smarthinking and your supervisor(s). You may continue to use Smarthinking for additional feedback.
Week 8: 3 April - 7 April	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). Prepare the final version of your Literature Review based on feedback from your supervisor(s) ready for submission on Monday, Week 9. You may continue to use Smarthinking for additional feedback. Perform an originality check on your Literature Review using Turnitin.
Week 9: 10 April - 14 April	Assessment	**Literature Review** Submit your Literature Review by 9pm, Monday.
	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s). If you haven't already done so, discuss how to plan out your project with your supervisor(s) and their expectations for the Project Plan task.
Week 10: 17 April - 21 April	Project	Attend any supervisor or research group meetings they have arranged with you, and continue with the project work recommended by your supervisor(s).

		Continue revising and expanding your Project Plan based on feedback from your supervisor(s). You may use Smarthinking for additional feedback.
Stuvac: 22 April - 27 April	Assessment	**Project Plan** Submit your Project Plan by 9pm, Monday.

Resources

Prescribed Resources

The Moodle page for this course is very important. As well as being a venue for the assessment information, submission and feedback, there are links to resources, advice, and guidance. While, the Research Thesis Projects page (enrollment code co3shyh) provides information about finding a thesis supervisor, answers to FAQs and advice on enrolment options.

Microsoft Teams will be used as the main discussion platform. You can ask questions there at any time, or during the weekly office hours session.

You also have access to 3 hours of Smarthinking tutor time. Please see the course Moodle page for instructions on how to use this service.

Recommended Resources

Your supervisor will advise you of books, journal articles and websites where you may find information as a starting point for your research project. After that, it is your responsibility to search out and evaluate information. Students are strongly encouraged to make use of a reference management system like EndNote, Mendeley or BibTeX. The Student Gateway also provides guidance on the particular forms of written communication found in thesis courses:

- Literature Reviews
- Research Proposals
- Honours Theses

Study space for project courses

Students enrolled in selected project-based or laboratory-based courses (e.g. thesis) are granted access to Room 102 on Level 1 of the Science and Engineering Building (Map Ref. E8). Access to this space is subject to the following conditions:

- Students must follow any directions from teaching and technical staff.
- This space is provided for private study and/or small group project meetings related to courses taught by the School of Chemical Engineering.
- Some classes have booked this space and students should vacate the space during these classes.
- Students using the space are expected to leave the space in the same or better condition than they found it. Keeping this in mind, limited consumption of food and drink is permitted.

Failure to observe any of these conditions may result in your access being revoked.

Course Evaluation and Development

We want your feedback on this course whether positive or negative. You can provide verbal or written feedback directly to the course coordinator, through our course's discussion forum or through the University's myExperience survey.

Feedback we received from previous offerings of this class have resulted in us

- Introducing a “Getting Started with Thesis” session.
- Introducing lessons on research skills, e.g. working with academic literature, writing critical reviews and researching safely.
- Providing more assistance in written communication via the Smarthinking service.
- Introducing a formative assessment in Week 3, so that you get sense of how you’re going.
- Creating online Office Hours sessions.
- Adding short topic talks to the Office Hours.
- Revising marking rubrics for clarity.
- Preparing guides for most assessments.

Laboratory Workshop Information

The requirements for risk management and lab access will differ between projects. If you have any questions about risk management policies and procedures, please contact the Faculty’s Health, Safety & Environment Team (eng.gen.hse@unsw.edu.au).

UNSW Supervised Projects

If your project being directly supervised by UNSW staff, you should consult with your supervisor about risk management for your project.

1. The School's General Safety page provides an introduction to the University safety system and School-specific arrangements, as well as safety induction information for the SEB (E8), Hilmer (E10), Tyree (H6) and Chemical Sciences (F10) Buildings. All students should at least complete Module 1 which introduces general safety procedures in the School of Chemical Engineering.
2. All projects will involve some desk or office-based activities (e.g. preparing reports, writing code, running simulations). There are risks associated with these activities that are not necessarily low. You should visit the UNSW Office Safety Toolkit page (https://safety.unsw.edu.au/office-safety-toolkit) to learn about safety in an office or desktop practice. The pages on Office Hazards and Risks and Workstation Setup will be particularly useful.
3. If your project involves laboratory or field work, you will need to complete the School of Chemical Engineering approval process. The steps involved are outlined on this webpage. To complete this process, you will have to fulfill various training and documentary requirements. Therefore you should allow several weeks to complete this process.

Industry Supervised/Hosted Projects

If your project is being hosted/supervised by an external organisation (e.g. a company or research organisation), then you need to comply with that organisation’s risk management policies and procedures.

1. You still need a UNSW supervisor – please consult with them about how they will be involved with your project – at the very least, they will be responsible for the academic administration of your project. They may wish to meet with you periodically to discuss your progress.
2. For the purposes of workplace health and safety legislation, you are considered a worker of that company and they are responsible for your safety.
    - If you are not being paid by the organisation for your thesis work, you are covered by the University’s personal accident and public liability insurance policies. A certificate of currency can be supplied.
    - If you are being paid by the organisation to conduct your thesis work, then you should be

covered by their insurance policies. Please check with your industry supervisor.

3. Finally, you **must** formally ask permission to do your project in industry. Do this by completing and submitting the “Application for distance thesis study” form on Moodle. Seeking formal permission ensures there is no confusion about why you are working onsite with an external organisation.

For more information, please read the guides on moving from Industrial Training to Honours, and for Thesis in Industry on the Research Thesis Projects page.

Project ethics approval

Does your thesis involve other people doing something for you? If so, it may require ethics approval.

The basic principle is that if you want people to provide you with something, even if just 5 min of their time to answer questions, then you should (i) treat them with suitable dignity and (ii) ensure any possibility that they may be badly affected is absolutely minimised.

When research at UNSW involves people, then it come under the oversight of the UNSW Ethics Committee which must give approval before it proceeds.

You will need to get approval, if your project involves any of the following (more than one may apply):

- a survey, even if done on-line
- an interview, focus group, or other such “qualitative” method
- data mining when individual identities might be revealed
- behavioural observation, e.g. people using something, choices people make, on-line activities
- recording or photography of people, even if in public spaces
- experiments on human reactions (or other abilities)
- human performance, e.g. running, falling, playing music
- testing a device (on people)
- tasting or smelling, e.g. foods
- and, of course, drug trials, body tissues and other medical activities.

Also, projects involving animals will need ethics approval. If your project does require approval, in the first instance, discuss this with your Supervisor.

Project confidentiality and intellectual property

Thesis project sometimes have information restrictions imposed upon them, typically a confidentiality agreement for industrially linked projects. If you are unsure whether this applies in your case, consult your supervisor.

If your project is subject to this kind of restriction you will need to ensure that any files you submit to Moodle are encrypted prior to upload and that the parties who have signed the relevant agreement are given copies of the password. Please seek advice from your supervisor in relation to hardcopy hand-in.

Further, students and academic supervisors may be asked to enter into a confidentiality or non-disclosure agreement. Students are entitled to seek independent legal advice before signing such an agreement. University staff should seek advice from the Research Contracts Office &/or UNSW Legal.

Distance study

It is possible to complete your entire project by distance.

You should discuss the particular arrangements for your project with your supervisor. This should include the nature of your project (e.g. types research/design, access to data), how you will meet and how often (at least fortnightly and preferably by video call), accessing to literature and software (e.g. via the UNSW Library, myAccess &/or China Students Access Network).

Then you must complete the “Application for distance thesis study” form available on Moodle. Since you probably won't have a supervisor at your off-campus location, please a reason like "unable to visit campus because of travel restrictions" in the distance supervision field. Next get your supervisor to sign the application. Finally, upload your application using the Upload form via the link on Moodle. You will receive notification in your email if your application is approved or rejected. The notification on Moodle may not change immediately, as it is a manual process.

Note: It is probably best to apply for permission for distance study for all your remaining thesis courses. If you do that, your permission status will be rolled over into future courses and you won't have to apply again next term.

Submission of Assessment Tasks

In the School of Chemical Engineering, all written work will be submitted for assessment via Moodle unless otherwise specified. Attaching cover sheets to uploaded work is not required unless specifically requested for an individual assessment task; when you submit work through Moodle for assessment you are agreeing to uphold the Student Code.

Some assessments will require you to complete the work online and it may be difficult for the course coordinator to intervene in the system after the due date. You should ensure that you are familiar with assessment systems well before the due date. If you do this, you will have time to get assistance before the assessment closes.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect. Please make it easy for the markers who are looking at your work to see your achievement and give you due credit.

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

Late penalties

Unless otherwise specified, submissions received after the due date and time will be penalised at a rate of 5% per day or part thereof (including weekends) and will not be accepted more than 5 days late. For some activities including Exams, Quizzes, Peer Feedback, and Team Evaluation surveys, extensions and late submissions are not possible.

Special consideration

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to submitting an assessment or sitting an exam.

UNSW has a Fit to Sit / Submit rule, which means that if you attempt an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

Please note that for **all** special consideration requests (including COVID-19-related requests), students will need documentary evidence to support absences from any classes or assessments.

Academic Honesty and Plagiarism

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage (International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013). At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and plagiarism can be located at:

- The Current Students site
- The ELISE training site

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

To help describe what we are looking for, here are some things that we consider to be quite acceptable (even desirable!) actions for many assessments, and some that we consider to be unacceptable in most circumstances. Please check with the instructions for your assessments and your course coordinator if you're unsure. As a rule of thumb, if you don't think you could look the lecturer in the eye and say "this is my own work", then it's not acceptable.

Acceptable actions	Unacceptable actions
✓ reading/searching through material we have given you, including lecture slides, course notes, sample problems, workshop problem solutions	✗ asking for help with an assessment from other students, friends, family
✓ reading/searching lecture transcripts	✗ asking for help on Q&A or homework help websites
✓ reading/searching resources that we have pointed you to as part of this course, including textbooks, journal articles, websites	✗ searching for answers to the specific assessment questions online or in shared documents
✓ reading/searching through your own notes for this course	✗ copying material from any source into your answers
✓ all of the above, for any previous courses	✗ using generative AI tools to complete or substantially complete an assessment for you
✓ using spell checkers, grammar checkers etc to improve the quality of your writing	✗ paying someone else to do the assessment for you
✓ studying course material with other students	

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism. Further information about referencing styles can be located at https://student.unsw.edu.au/referencing.

For assessments in the School of Chemical Engineering, we recommend the use of referencing software such as Mendeley or EndNote for managing references and citations. Unless required otherwise

specified (i.e. in the assignment instructions) students in the School of Chemical Engineering should use either the APA 7th edition, or the American Chemical Society (ACS) referencing style as canonical author-date and numbered styles respectively.

Artificial intelligence tools such as ChatGPT, CodePilot, and built-in tools within Word are modern tools that are useful in some circumstances. In your degree at UNSW, we're teaching you skills that are needed for your professional life, which will include how to use AI tools responsibly plus lots of things that AI tools cannot do for you. AI tools already are (or will soon be) part of professional practice for all of us. However, if we were only teaching you things that AI could do, your degree would be worthless, and you wouldn't have a job in 5 years.

Whether the use of AI tools in an assessment is appropriate will depend on the goals of that assessment. As ever, you should discuss this with your lecturers – there will certainly be assessments where the use of AI tools is encouraged, as well as others where it would interfere with your learning and place you at a disadvantage later. Our goal is to help you learn how to ethically and professionally use the tools available to you. To learn more about the use of AI, see this discussion we have written where we analyse the strengths and weaknesses of generative AI tools and discuss when it is professionally and ethically appropriate to use them.

While AI may might provide useful tools to help with some assessments, UNSW's policy is quite clear that taking the output of generative AI and submitting it as your own work will never be appropriate, just as paying someone else to complete an assessment for you is serious misconduct.

Academic Information

To help you plan your degree, assistance is available from academic advisors in The Nucleus and also in the School of Chemical Engineering.

Additional support for students

- Current Student Gateway for information about key dates, access to services, and lots more information
- Engineering Student Life - Current Student Resources for information about everything from getting to campus to our first year guide
- Student Support and Success for our UNSW team dedicated to helping with university life, visas, wellbeing, and academic performance
- Academic Skills to brush up on some study skills, time management skills, get one-on-one support in developing good learning habits, or join workshops on skills development
- Student Wellbeing, Health and Safety for information on the UNSW health services, mental health support, and lots of other useful wellbeing resources
- Equitable Learning Services for assistance with long term conditions that impact on your studies
- IT Service Centre for everything to do with computing, including installing UNSW licensed software, access to computing systems, on-campus WIFI and off-campus VPNs

Course workload

Course workload is calculated using the Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations. Most 6 UoC courses will involve approximately 10-12 hours per week of work on your part. If you're not sure what to do in these hours of independent study, the resources on the UNSW Academic Skills pages offer some suggestions including: making summaries of lectures, read/summarise sections from the textbook, attempt workshop problems, reattempting workshop problems with some hints from the solutions, looking for additional problems in the textbook.

Full-time enrolment at university means that it is a *full-time* occupation for you and so you would typically need to devote 35 hours per week to your studies to suceed. Full-time enrolment at university is definitely incompatible with full-time employment. Part-time/casual employment can certainly fit into your study schedule but you will have to carefully balance your study obligations with that work and decide how much time for leisure, family, and sleep you want left after fullfilling your commitments to study and work. Everyone only gets 168 hours per week; overloading yourself with both study commitments and work commitments leads to poor outcomes and dissatisfaction with both, overtiredness, mental health issues, and general poor quality of life.

On-campus class attendance

In 2023, most classes at UNSW are running in a face-to-face mode only. Attendance is expected as is

participation in the classes. As an evidence-driven engineer or scientist, you'll be interested to know that education research has shown students learn more effectively when they come to class, and less effectively from lecture catch-up recordings. If you have to miss a class due to illness, for example, we expect you to catch up in your time, and within the coming couple of days.

For most courses that are running in an "in person" mode:

- Lectures are normally recorded to provide an opportunity to review material after the lecture; lecture recordings are not a substitute for attending and engaging with the live class.
- Workshops/tutorials are not normally recorded as the activities that are run within those sessions normally cannot be captured by a recording. These activities may also include assessable activities in some or all weeks of the term.
- Laboratories are not recorded and require in-person attendance. Missing laboratory sessions may require you to do a make-up session later in the term; if you miss too many laboratory sessions, it may be necessary to seek a Permitted Withdrawal from the course and reattempt it next year, or end up with an Unsatisfactory Fail for the course.
- Assessments will often require in-person attendance in a timetabled class or a scheduled examination.

This course outline will have further details in the Course Schedule and Assessment sections.

Class numbers are capped in each class to ensure appropriate facilities are available, to maintain student:staff ratios, and to help maintain adequate ventilation in the spaces. Only students enrolled in each specific classes will be allowed in the room. Class rosters will be attached to corresponding rooms and circulated among lab demonstrators and tutors. No over-enrolment is allowed in face-to-face classes.

In certain classroom and laboratory situations where physical distancing cannot be maintained or the staff running the session believe that it will not be maintained, face masks will be designated by the course coordinator as **mandatory PPE** for students and staff. Students are required to bring and use their own face mask. Mask can be purchased from IGA Supermarket (Map B8, Lower Campus), campus pharmacy (Map F14, Middle Campus), the post office (Map F22, Upper Campus) and a vending machine in the foyer of the Biological Sciences Building (Map E26, Upper Campus).

Your health and the health of those in your class is critically important. You must stay at home if you have COVID-19 or have been advised to self-isolate by NSW health or government authorities.

Asking Questions

Asking questions is an important part of learning. Learning to ask good questions and building the confidence to do so in front of others is an important professional skill that you need to develop. The best place to ask questions is during the scheduled classes for this course, with the obvious exception being questions that are private in nature such as special consideration or equitable learning plans. Between classes, you might also think of questions — some of those you might save up for the next class (write them down!), and some of them you might ask in a Q&A channel on Teams or a Q&A forum on Moodle. Please understand that staff won't be able to answer questions on Teams/Moodle immediately but will endeavour to do so during their regular working hours (i.e. probably not at midnight!) and when they are next working on this particular course (i.e. it might be a day or two). Please respect that staff are juggling multiple work responsibilities (teaching more than one course, supervising research students, doing experiments, writing grants, …) and also need to have balance between work and the rest of their life.

Note: 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

Pilot Hall with experiment rigs // UNSW Chemical Engineering

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	