Undergraduate thesis
Faculty rules and procedures

The Faculty of Engineering at UNSW established a working group of all the UG thesis coordinators from the various schools in late 2013. The goal of this group was to provide some consistency and uniformity amongst the thesis in the schools. The committee has worked together to learn from the best practices within each school and to create common documents and procedures that could be used in all schools. As such, 8 faculty wide procedures have been created through the committee. These documents have been subsequently approved and ratified by the Faculty Programs Committee and the Faculty Board. The 8 procedures are:

1. Course Aim and Learning Outcomes
2. Assessment Procedure
3. Thesis A & B Report Marking Criteria
4. Participation Mark Marking Criteria
5. Application of Extension Guidelines
6. How to deal with Failures
7. Dealing with Late Submission
8. Discrepancy amongst marks procedure.

UNSW Engineering Undergraduate Thesis Aims & Learning Outcomes

Course Aims

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

Course Learning Outcomes (mapped to BE Program Learning Outcomes below)

At the conclusion of this course, students should be able to:

1. Develop a design or a process or investigate a hypothesis following industry and professional engineering standards. (7, 8, 9, 10)
2. Critically reflect on a specialist body of knowledge related to their thesis topic. (3)
3. Apply scientific and engineering methods to solve an engineering problem. (7)
4. Analyse data objectively using quantitative and mathematical methods. (2, 7, 8)
5. Demonstrate oral and written communication in professional and lay domains. (12)

Discipline specific course learning outcomes can be added as needed.

BE (Hons) Program Learning Outcomes

1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.
4. Discernment of knowledge development and research directions within the engineering discipline.
5. Knowledge of engineering design practice and contextual factors impacting the engineering discipline.
6. Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
7. Application of established engineering methods to complex engineering problem solving.
8. Fluent application of engineering techniques, tools and resources.
9. Application of systematic engineering synthesis and design processes.

10. Application of systematic approaches to the conduct and management of engineering projects.
11. Ethical conduct and professional accountability.
12. Effective oral and written communication in professional and lay domains.
13. Creative, innovative and pro-active demeanour.
14. Professional use and management of information.
15. Orderly management of self, and professional conduct.
16. Effective team membership and team leadership.

Assessment Procedure

It is intended that Thesis A cover the planning/prepping and completing some initial work on the project, while Thesis B includes the research (lab or otherwise) and the writing of the thesis document itself. The following course assessments relate to the student's research planning (A), conducting the research project and writing the thesis document (B), and disseminating the results in different forms (A/B).

The proposal is a potential approach to assessment in the two courses, attempting to standardise assessment in a way that reflects current practice. It is designed to provide consistency across the schools, while also allowing for flexibility to reflect the different requirements of school/groups/projects.

Thesis A

1. Interim report – 75% ± 5%. This may include
   a. Literature review or equivalent– to include problem statement, hypothesis and aims, indicative length is 10-15 pages, ~70%
   b. Project planning – to include proposed solutions, thesis outline, preliminary work done ~20%
   c. Document presentation – ~10%
   d. Risk assessment – Must be completed to move on – Requirement
2. Project dependent deliverable work – 25% ± 5%
   a. School/project dependent, some possibilities:
      i. Presentation
      ii. marking of lab books
      iii. assessing levels of intellectual contribution (e.g., did the student come up with ideas or were they just a pair of hands)
      iv. attendance at lab and meetings

All to be marked by supervisor or with an additional assessor.

Thesis B

1. Written Report – 75% ± 5%
   a. Lit review/background and putting the results in context (10%)
   b. Execution of the research project, quality of analysis, discussion of results, (50%)
   c. Conclusions and value added (20%)
   d. Document presentation (20%)
2. Participation mark – 0-10%
   a. Many possibilities. Some possible suggestions are:
      i. marking of lab books
      ii. assessing levels of intellectual contribution (e.g., did the student come up with ideas or were they just a pair of hands)
      iii. attendance at lab and meetings
   [INTERNAL ONLY: Should result in the supervisor marking the thesis (point 1) just on the written thesis document itself (no inflation)]
3. Two forms of dissemination in addition to the thesis document itself – 15% ± 5%
   a. The two forms of dissemination can occur in either Thesis A or B as long as it is clearly identified and described in the course outline.
   b. Two different types of dissemination must be used. There is flexibility amongst the schools as

to what these types of dissemination are, but each school must clearly identify what the two forms are.

c. Some options include: Oral presentation, poster, other media, practical demonstration, conference abstract, web page, etc.

1 and 3 to be marked by 2 markers, with at least one of these to be a marker other than the supervisor or co-supervisor.

UNSW Engineering Thesis Marking Criteria

Thesis A – Marking scheme for Interim Report – 75 marks

Criterion 1: Reviewing the work of others (70%)

Criterion 2: Articulating a research question and a plan (20%)

Criterion 3: Document presentation (10%)

Criterion 1: Reviewing the work of others (70%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Deficient	Deficient work may be characterised by a number of features, including inappropriate reliance on sources not peer reviewed (such as the internet), not reviewing what should be the core of the literature in a particular area, or not reviewing any recent work (within, for example, the last 5 years although this will depend somewhat on the field).
Pass	50-64	Adequate	The literature reviewed is sufficient to inform the proposed research, although it is likely that further review will be required as the work progresses. What distinguishes work at this level from work at the next level up is quantity: an adequate review of the literature sketches enough that the reader can see what the picture is about, but neglects significant aspects. ie, are there significant holes in this review?
Credit	65-74	Solid	The most significant areas of literature relevant to the proposed work have been reviewed. There are no major "holes". What is generally missing in this band, but present in higher quality work, is the student showing that they understand the conceptual relationships between the different reviewed works.
D	75-84	Solid, and linked	The most significant areas of literature relevant to the proposed work have been reviewed and the student has clearly identified one or more knowledge gaps. The student will have shown that they understand the conceptual relationships between reviewed works and between reviewed works and the student's research project. ie, the student makes intellectual connections between the different parts of the review and puts their work in context.
HD	85-100	Of review paper quality	In addition to meeting the quality at the previous band – "Solid, and linked" – the student has made a critical assessment of the literature in the context of their research project to a depth and breadth that is of the quality that could be anticipated to be seen in a journal review paper. [INTERNAL USE ONLY: Individual schools need to moderate this comment to markers: Note that although performance at this level is seen from time to time, *it is quite uncommon in certain schools*.]

Criterion 2: Articulating a research question, plan and thesis outline (20%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Broad context missing.	The research question is not explained, and no clear demonstration of student understanding. Research plan is not present, or does not have sufficient detail to demonstrate they can successfully complete a thesis project. No thesis outline is presented (i.e., thesis chapter headings). [INTERNAL: Statements equivalent to "The aim is to understand XYZ" by themselves would not constitute a clear explanation – unless it is also made clear why we don't currently understand XYZ, and why it's important.]
Pass	50-64	Broad context present. No specific plan.	Research question and plan are presented, but lack detail and a logical plan of investigation. There is enough of a plan to believe that the research project is feasible. Generic chapter headings may show no particular relevance to the research. [INTERNAL: What we often see here is very generic statements of a project plan, for instance "write a computer model" or "conduct experiments" or "analyse results", without any explanation of what said activities are intended to achieve, what approaches might be considered etc. What this usually indicates is that the student has made only a superficial attempt at planning and doesn't really have a firm grasp of the logic of the investigation.]
Credit	65-74	Broad context present. Specific logical plan.	Research question and plan are presented, and include some detail. There is enough of a plan to believe that the research project is feasible, and that student understands the resources and time required. The plan does not appear to be informed by the literature review – it sits largely separately to the literature review, it is not part of the narrative developed in the review. Thesis outline reflects the research plan, but lacks enough detail. [INTERNAL: I understand the approach that is explained in the research plan, and how it can answer the research question posed. The student clearly understands the logic of their proposal.]

D	75-84	Broad context present.	The plan fits within the narrative set out by the literature review – the student makes clear why the plan is developed this way in the narrow context of the reviewed literature.
		Specific logical plan.	The research plan demonstrates a logical and feasible course of action. Realistic milestones have been set.
			Thesis outline that demonstrates a logical vision for the thesis.
		Plan fits the review narrative.	[INTERNAL: I understand the approach that is explained in the research plan, and how it can answer the research question posed. The student clearly understands the logic of their proposal.]
HD	85-100	Broad context present.	The plan is robust and has provision for project variations and contingencies.
		Specific **and robust** logical plan.	The plan fits within the narrative set out by the literature review – the student makes clear why the plan is developed this way in the context of the reviewed literature.
			Thesis outline includes sub-sections, logical flow with a clear connection to the project plan and literature review.
		Plan fits the review narrative.	[INTERNAL: I understand the approach that is explained in the research plan, and how it can answer the research question posed. The student clearly understands the logic of their proposal.]

Criterion 3: Document presentation (10%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Impedes document reading	Presentation is poor to the extent that it impedes reading of the document. Examples include multiple inconsistent citation styles or incomplete citations, unintelligible grammar, figures or tables not labelled or badly inconsistent document formatting.
Pass	50-64	Poor formatting / document structure	Document is not at a professional level. Although figures and diagrams are labelled and references in text match reference list (and vice versa), formatting is unclear and inconsistent to the extent that the reader can lose track of the context when reading.
Credit	65-74	Poor judgement with respect to layout, possible padding	Appropriate use of section and sub-section heading structures, . Figures and diagrams are labelled, formatting is consistent, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. There may be superfluous material present, such as unnecessary, repetitive or unusually large figures, unnecessarily lengthy text, unusually wide margins, unnecessary appendices, etc.
D	75-84	Professional, may have issues with data presentation	Everything from above, plus a logical flow of sections, and appropriate judgement in the placement data, tables or figures in the body of the work or the appendices. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. Some of the graphical presentation of data is inappropriate - poor choice of axes, overcrowding, poor use of chart space etc.
HD	85-100	Professional, concise and readable	Everything from above, plus text is clear and concise. Graphical presentation of data is appropriate, clear and economical.

Thesis B - Marking scheme for Final Thesis – 75 marks

Criterion 1: Lit review/background and putting the results in context (20%)

Criterion 2: Execution of the research project, quality of analysis, discussion of results (50%)

Criterion 3: Conclusions, and value added (20)%

Criterion 4: Document presentation (10%)

NOTE for markers

Please provide comments if you have any concerns with the veracity of the results.

Please provide your general views on the thesis and sum up how you arrived at your mark with reference to specific main points (remarks here are not shared with the student).

Criterion 1: Lit review/background and putting the results in context (20%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Aims not clear	The student hasn't done a good job explaining the research aims to the reader - I'm not really sure what this is about.
Pass	50-64	Reason for research not clear	I understand the project aims but the student has not made it clear to the reader how it is connected to the background - why is this aim being pursued? What is the hypothesis being tested? What is the broader significance?
Credit	65-74	Background clear - results not contextualised	The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The student has not been able to take a step back and make an assessment of the significance of their results.
D	75-84	Background and aims are clear, context is incomplete	The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The literature review is comprehensive but may be lacking depth of insight. The student has made a reasonable attempt to assess the significance of their results but it is either not realistic, or does not follow logically from the arguments presented.
HD	85-100	Background to research and significance of conclusions reached are clear	The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The student also makes a realistic assessment of the significance of their results in this context. The literature review is comprehensive and insightful.

Criterion 2: Execution of the research project, quality of analysis, discussion of results (50%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Clearly deficient	Work at this level is clearly deficient - in not addressing the stated project aims or in containing major problems that the student should reasonably have been aware of but did not address in the thesis.
Pass	50-64	"Thin" results, lacking intellectual engagement	The student has completed a body of work and presented some results but not succeeded in interpreting meaning from them (=intellectual input is largely absent from the discussion, which is essentially equivalent to observation of the results). Performance at this level may also indicate a lack of engagement with the project, sometimes evidenced as a "thin" or "one-dimensional" investigation characterised by attempted padding.
Credit	65-74	Several components to the research work, not coherently linked.	The student probably has a number of components to their research, such as literature, experiments, designs, simulations etc. They have interpreted meaning from the results but have overall not succeeded in linking the components of their research together as a coherent scientific story. There's no clear "big picture".
D	75-84	Solid, coherent work, linking all the research components together into a consistent story.	At this level the student has assembled the pieces of their research project (which could include literature, different sets of experiments or measurements, simulations or analyses) into a coherent scientific story. Overall, you are left with a clear and convincing picture of what the research question was and what the answer is (along with its caveats). A student is generally not going to be able to achieve this if there are conceptual or methodological problems with their work, or if their review of literature is inadequate.
HD	85-100	Solid, coherent and consistent story PLUS something unexpected.	Student would have to have achieved as at the previous level but additionally has achieved something unexpected, thoughtful and original, such as a novel perspective or theory. This requires deep thinking of the student.

Criterion 3: Conclusions, and value added (20%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	No value	There are obvious and substantial problems with what was presented – the work as it stands has no value because it doesn't "hold water".
Pass	50-64	No interesting results	The presented work is not at all challenging and yields entirely expected results – the student does not appear to appreciate this. The work doesn't really add any significant value.
Credit	65-74	Minimal value	The presented work adds some value in some way – improvement of "local knowledge" such as techniques, additional data points in a larger design or hypothesis etc. The student worked well but did not push themselves harder to make any real new discoveries or interpretations, therefore the conclusions are limited and discussions of future work are predictable extensions of the work completed.
D	75-84	Will have wider impact when further work is done.	You are fairly sure that the results and discussion can eventually form the core of a research publication or change in industry practice (It may have already been included in a conference publication during the course of the thesis). However, further work will first be required – such as repeated experiments – before the work is truly sufficient. The student has included good, thoughtful discussion of limitations and provided insight into future work on this project or new avenues of research which could be followed.
HD	85-100	Will have wider impact now.	This is valuable work. This work can easily form the basis of a peer-reviewed journal publication, or other form of professional dissemination/presentation appropriate to the field (i.e. patent application, best practice document at a company, trade publication, workshop, etc.).

Criterion 4: Document presentation (10%)

Grade	Mark	Brief description	Longer explanation / examples
Fail	0-49	Impedes document reading	Presentation is poor to the extent that it impedes reading of the document. Examples include multiple inconsistent citation styles or incomplete citations, unintelligible grammar, figures or tables not labelled or badly inconsistent document formatting.
Pass	50-64	Poor formatting / document structure	Document is not at a professional level. Although figures and diagrams are labelled and references in text match reference list (and vice versa), formatting is unclear and inconsistent to the extent that the reader can lose track of the context when reading. The structure of the document is poor or illogical, with little discernible flow.
Credit	65-74	Poor judgement with respect to layout, possible padding	Document is not at a professional level. Figures and diagrams are labelled, formatting is consistent, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. Poor judgement has been exercised in placing data, tables or figures in the body of the work, and/or excessive figures/tables – some of which would have been better placed in an appendix or discarded. An attempt might have been made to "pad" the work or increase the page count using unnecessary, repetitive, or large figures, unnecessarily lengthy text, wide margins, etc. The language is not sophisticated or sufficient for describing the technical aspects clearly and rigorously, and there are disjointed aspects to the structure.
D	75-84	Professional, may have issues with data presentation	Document is at a professional level. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled, and good use made of appendices. Some of the graphical presentation of data is inappropriate - poor choice of axes, overcrowding, poor use of chart space etc. Padding is not a feature of work at this level. The structure is well thought out and logical, and there is a good command of descriptive and technical language – descriptions and explanations have depth but clarity, and are concisely worded.
HD	85-100	Professional, concise and readable	Document is at a professional level. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly

UNSW Engineering Thesis B – Participation Mark

Student's Name:		Student ID:	Program Code:
Thesis/Project Title:			

Important note: This assessment is to evaluate only one particular aspect of student's performance, namely the level of student's participation throughout the course of doing thesis/project work. The supervisor would have the best knowledge on this aspect and thus is the most appropriate authority to make this judgment. Please complete this assessment independently of the written report. This assessment counts for 10% of the total Thesis/Project B mark.

Criteria	Weightings	Marking Guide	Student's Marks
Initiative and engagement: Did the student actively engage in the thesis work, take ownership of the task with enthusiasm, initiate own ideas to overcome various roadblocks along the journey?	1/3	0-49: Deficient – none or minimal effort across all areas, need a lot of pushing from supervisor to make things happen 50-64: Satisfactory – some evidence of student driving the project; student put in some effort but considerable need for improvement 65-74: Good – above satisfactory effort, clear evidence of student driving the project 75-84: Very good – student showed genuine interest and enthusiasm in the work, initiated many own ideas during the process 85-100: Excellent – superior evidence of effort; student intellectually and practically led the project all the way, went beyond what was expected of a student	/100
Sustained activity: for example, based on student's attendance in lab, regular meetings/contacts with supervisor throughout the semester, etc	1/3	0-49: Deficient – irregular, sporadic engagement in the project 50-64: Satisfactory – regular engagement but only just adequate 65-74: Good – regular engagement; project progressing smoothly as planned 75-84: Very good – high level of sustained effort throughout the whole project 85-100: Excellent – superior evidence of effort, student attended all meetings or had regular weekly contact with the supervisor	/100
Diligence and competence in performing the task: for example, based on examination of relevant documentation (project diary, student's lab book detailing experiment activities or measurement records). Did the student put in serious effort? Was it meticulous, professional?	1/3	0-49: Deficient – careless or technically incompetent in doing the work 50-64: Satisfactory – you are fairly sure results from project are useable and trustworthy 65-74: Good – you closely monitored the work and are confident with student's results 75-84: Very good – work is professionally, meticulously performed and recorded 85-100: Excellent – very persistent and unrelenting in performing the task, demonstrate superior level of knowledge and applied thinking to solving an engineering problem	/100

Comments: _____

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Faculty of Eng Undergraduate Thesis Application for Extension Guidelines

Normal cases for special consideration (illness, misadventure) should be lodged through the formal UNSW system and dealt with according.

Other applications for extension of submission of thesis reports (e.g. equipment breakdown, etc.):

1. The request for extension must come from the supervisor. That is, it is written by, and justified, by the supervisor.
2. Request must be lodged by week 9 of term.
3. Panel decision will be made by end of week 10.
4. The decision will be made by a panel – consisting of the HoS (or their nominee), Thesis Coordinator, and 1 other person.
5. Students should be alerted to the fact that this is not guaranteed, and thus should not rely on getting an extension.
6. Typically extensions are granted UP TO 3 weeks. The length of the extension need to be requested and justified by the supervisor. Panel will decide the length of time granted.

UNSW Engineering Fail/Late/Discrepancy of marks Procedures

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

Fail in Thesis B – Students have three options.

1) re-enrol for Thesis A & B again, new project and supervisor
2) re-enrol for Thesis B 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.
   a. This option is only available if the original mark was ≥40, OR if the student is in their last semester before graduation (regardless of the original mark).

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

- For all other assignments beside thesis – zero (0) mark is awarded
- For thesis – 5 marks off the *thesis* for every day late. Penalty applies until the marks for the *course* decrease to 50, and further lateness does not result in failure of the *course*, but might be a failure of the thesis (weekends count as days).
    o N.B. According to the recommended faculty guidelines on thesis, the actual thesis makes up 75% of Thesis B. The other 25% is 10% supervisor mark (for marking the process of doing the thesis) and 15% for two other deliverables (i.e., oral, poster, webpage, abstract, etc)
    o Example #1, if the thesis is assessed at a 77, but was turned in 5 days late, the mark for the thesis is 52 (77-5*5). If the other 25% is marked at 75, the course mark is 57.75.
    o Example #2, if the thesis is assessed at 68, but was turned in 7 days late. The thesis mark is 33 (68-5*7). If the other 25% is marked at 70%, the calculated course mark would be 42.25, but would be brought up to the final mark of 50 for the course. (i.e., you don't fail because of lateness)
- Any thesis not turned in within 6 weeks after the deadline will be finalised at zero (0) marks.

Discrepancy amongst thesis marks - Thesis marks should be provided by the two assessors independently, without collusion or knowledge of the other mark.

- For any mark difference less than or equal to 10 marks, the unweighted average.
- For any mark difference of 11-15 marks, the Thesis Coordinator discusses with the two markers about why they gave their marks and assists the two markers to come to an agreement on a final mark.
- For any mark difference greater than 15 marks a third assessor must be used. An unweighted average of the three marks will be used.
- If the situation arises that one mark is invalid, the Thesis Coordinator has the discretion to eliminate that mark and average the other two (if they fall within the 10 mark difference).