



Faculty of Engineering

Undergraduate Thesis Rules and Procedures

16 January 2019

UNSW Engineering thesis working group, made up of all School UG thesis coordinators, continued its work in 2018 with focus on reviewing and revising the UG Thesis structure as The University adopts the trimester based UNSW3+ academic calendar from 2019. While the focus was on undergraduate (UG) thesis, postgraduate (PG) thesis has also undergone revisions, although this document will provide guidelines on UG thesis streams only.

The new Thesis structure was approved by the Faculty Programs Committee on 10 September 2018 and consists of Thesis A, Thesis B and Thesis C, with the option of students taking Thesis B and C together in one term with appropriate permissions. The subsequent goal of the working party was to revise the current UG Thesis Faculty rules and procedures as they stood from the 2015 agreement to incorporate the new thesis structure.

Note that some Schools may offer the thesis courses in 2 different forms: one form being research-based and the other being professional practice-based. Practice theses may be offered as 2 6 UoC courses.

1. Course Aim and Learning Outcomes
2. Assessment Procedure
3. Thesis A, B & C 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)
6. Complete a risk assessment associated with a project.

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.

Faculty-wide UG Thesis Rules (applies to all Schools)

- By default, students ordinarily take Thesis A, Thesis B and Thesis C in consecutive terms.
- The prerequisites for Thesis B and Thesis C are Thesis A and Thesis B, respectively.
- With School permission, students may take Thesis B and C together. This option should be limited only to students who can demonstrate the ability to progress. This will require a prerequisite waiver to waive the Thesis B requirement for Thesis C.
- Students must take Thesis courses in consecutive terms, unless exceptional circumstances are demonstrated by the student through the standard channels and accepted by the School.
- Students may not undertake Industrial Training while enrolled in Thesis A, B or C, unless exceptional circumstances are demonstrated by the student and accepted by the School.
- Students may enrol in up to and including 20 UoC while undertaking Thesis B & C together (i.e. 12 UoC of non-thesis courses and 8 UoC of Thesis B & C). While this is overloading and so requires manual enrolment, permission for that will be given automatically. Students who wish to enrol in 22 UoC or more while undertaking Thesis (i.e. 18 UoC of credit and 4 UoC of Thesis) will need to apply for, and be approved to overload.
- Thesis A, B and C should be offered in every term. Exceptions may be granted with appropriate justification.
- Thesis A and B will initially carry a 'satisfactory' (EC grade) or 'not satisfactory' (EF grade). A student's final Thesis mark for A, B and C will reflect the overall weighted percentage of marks achieved during all three courses once Thesis C is completed, and the earlier EC grades will be replaced with the final mark at that time.

Assessment Procedure

Thesis A: It is intended that Thesis A cover the scoping, planning, and completing preparations for the project.

Thesis B: The primary intention behind Thesis B is to ensure students stay on track with their projects and project work as they progress through the year.

Thesis C: Thesis C continues the project work. The key deliverable is the Written Report.

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

General assessment requirements (applicable to all Schools):

1. At least *one* assessment must assess student oral communication skills
2. There must be a progress review 'checkpoint' by the end of Week 10 in Thesis A to assess whether students are able to continue into Thesis B, or into Thesis B and C together
3. If students are enrolled in Thesis B & C concurrently, there must be a formal progress review 'checkpoint' by the end of Week 4, prior to census date, to ensure

students are on track with their projects and able to continue with Thesis B+C together. Students enrolled in Thesis B alone may delay this formal review, but something informal should still occur prior to census.

When choosing to make the decision to progress students, Schools should exercise their duty of care to students and ensure that students (and relevant administrative staff) are given enough time to take action regarding a student's enrolment in Thesis B and/or Thesis C prior to the census date on the Sunday of Week 4.

Overview of Marking and Weighting Structure

A student's final thesis mark for all of Thesis A, B and C will reflect the final weighted average mark, determined by individual assessment element weightings as indicated below. There is generally 5-10% flexibility for Schools to determine their preferred weightings for component marks.

Summary

| Assessment Title | Min weighting | Max weighting | When |
|---|---------------|---------------|-----------------|
| Interim Report, Project Plan and Project Dependent Preparations | 10% | 20% | Thesis A |
| Progress Report | 5% | 15% | Thesis B |
| Participation | 0% | 10% | Thesis A, B & C |
| Second Project Dependent Deliverable | 5% | 15% | Thesis C |
| Final Thesis Report | 60% | 65% | Thesis C |
| <i>Total overall weighting</i> | <i>100%</i> | | |

1. The variations allow for recognition of the effort involved in formats of delivering these outputs, e.g. a seminar could appear in several places, and when it does it will necessarily require a higher weighting.
2. At least one task must have an oral component.

Thesis A Assessment

| Criterion | Tasks | Weighting | Pages |
|--------------------------------|---|-----------|-------|
| Literature Review | <p><i>(What is the problem to be solved, and its significance?)</i></p> <ul style="list-style-type: none"> • Brief background to project • Summary of literature relevant to project • Identification of “gaps” in the literature • Problem Statement (informed by gaps in the literature) • Hypothesis and aims | 50% | 12-15 |
| Project Plan | <p><i>(How will the student answer the research question in the given time using their available resources?)</i></p> <ul style="list-style-type: none"> • Proposed Solution/Experimental Methodology • Thesis timeline – for next two terms <ul style="list-style-type: none"> ○ Justification of time allocation for each task • Available resources identified • Required training and upskilling identified | 20% | 3-5 |
| Project Dependent Preparations | <p><i>(Can the student achieve the aims in the timeline? What progress has been made already?)</i></p> <p>Project specific, but may include</p> <ul style="list-style-type: none"> • Evidence of training on specific equipment • Evidence of some upskilling in new software/methods • Preliminary results • Preliminary sketches • Components/parts ordered • Detailed budget of parts to be ordered • Risk Assessment | 20% | 1-2 |
| Document Presentation | <ul style="list-style-type: none"> • Report or slide structure and layout • English skills – spelling, grammar • Data presentation (if applicable) • Clarity of writing • Citations consistent and correctly formatted | 10% | N/A |

Note that the Thesis A Report may require TWO deliverables. If so, the internal weights for these need not match the table, but their combination should do so.

Thesis B Assessment

Progress Report

For students enrolled in Thesis B and C concurrently, the progress report should be submitted before the census date (end of Week 4) to allow students enough time to withdraw from thesis B if their progress is inadequate.

For students enrolled in Thesis B alone, this report may be submitted later in Thesis B.

| Criterion | Tasks | Weighting |
|--|---|-----------|
| Progress Report | | 60% |
| Reflections on Progress | | 15% |
| Updated Plan for the remainder of Thesis | | 15% |
| Document Presentation | <ul style="list-style-type: none">• Report or slide structure and layout• English skills – spelling, grammar• Data presentation (if applicable)• Clarity of writing• Citations consistent and correctly formatted | 10% |

Note that the Thesis B Progress Report may require TWO deliverables. If so, the internal weights for these need not match the table, but their combination should do so.

Thesis C Assessment

1. Written Report – 60% to 65%

- 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 – 5% to 10%

Many possibilities. Some possible suggestions are:

- a. marking of lab books
- b. assessing levels of intellectual contribution (e.g., did the student come up with ideas or were they just a pair of hands)
- c. attendance at lab and meetings

3. Second Project dependent deliverable work – 5% to 15%

- a) School/project dependent, some possibilities:
 - i. Presentation
 - ii. Poster
 - iii. Conference paper/abstract

The final thesis report must be marked by at least two markers, who may include the project supervisor.

All other deliverables to be marked by supervisor and/or with an additional assessor. Ideally, each non-final report deliverable should be marked by at least two assessors. These deliverables may occur held in Thesis A, B or C.

Two different forms of dissemination, in addition to the thesis document itself, must occur in during completion of Thesis A, B and C. The forms of dissemination should be clearly identified and described in the course outline. At least one form must involve an oral component.

- a. There is flexibility as to what these types of dissemination are, but each course outline must clearly identify what the two forms are.
- b. Some options include: Oral presentation, seminar, poster, other media, practical demonstration, conference abstract, web page, etc.