



# Course Outline

Semester 1 2016

Never Stand Still

Engineering

Mechanical and Manufacturing Engineering

## **MMAN4020**

## **THESIS B**

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# 1. Staff Contact Details

All academic staff together with some senior engineers from industry act as supervisors to the students undertaking BE thesis work. Support is also provided by the workshop and laboratory staff.

## Contact details of the Course Coordinator

Associate Professor Tracie Barber  
School of Mechanical and Manufacturing Engineering  
Ainsworth Building 401A  
Tel (02) 9385 4081  
Email [t.barber@unsw.edu.au](mailto:t.barber@unsw.edu.au)

It is recommended you email to make a specific appointment if you need to discuss any important issues, particularly if you want to discuss extensions, supervisor issues, etc. Always consult the course Moodle first in case your questions have already been answered, or in the event that others may benefit from reading what you are asking and the response.

## Contact details of the Thesis Administrator

Contact Kane directly, cc'ing Tracie, if you have issues relating to your enrolment, progress, or other administrative queries of a technical nature.

Mr Kane Murdoch      School of Mechanical and Manufacturing Engineering  
Student Services office, Ainsworth Building, Level 1.  
Tel (02) 9385 4154  
[kane.murdoch@unsw.edu.au](mailto:kane.murdoch@unsw.edu.au)

# 2. Course details

## Units of credit

This is a 6 unit-of-credit (UoC) course, but there are no prescribed contact hours per week other than what you have arranged with your supervisor.

**It is essential that you consult the Moodle site for the most up-to-date and detailed information relating to the thesis.**

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, learning activities, preparation and time spent on all assessable work.”

However, in this course you have no class contact hours and no assessable work other than your thesis submission.

For a standard 24 UoC in the semester, this means 600 hours, spread over an effective 15 weeks of the semester (thirteen weeks plus stuvac plus one effective exam week), or 40 hours per week, for an average student aiming for a credit grade. Various factors, such as your own ability, your target grade, etc., will influence the time needed in your case.

Some students spend much more than 40 h/w, but you should aim for not less than 40 h/w on coursework for 24 UoC.

This means that you should aim to spend not less than about 10 h/w on this course, including consultation with supervisor and workshop/laboratory staff and library/internet search. However, most students spend more time on their thesis work.

### **Contact Hours**

There are no set contact hours for this course.

### **Summary of the course**

BE Thesis is usually completed in two consecutive semesters during the last academic year. This is the only course where the students have complete freedom to work on his/her chosen thesis projects from the initiation to the end – the project contains a large amount of original research and/or novel design work or analysis. It is not the responsibility of the supervisor to tell the student what to do, nor should it be assumed that the supervisor is an expert in all areas of engineering. They are there to offer guidance and advice, as are laboratory staff, workshop staff, and others in the school that may have expertise in the area of your project. The successful execution of the project is solely the responsibility of the student.

### **Aims of the course**

Thesis B is to be taken in the last semester required for the completion of all requirements for the award of the degree, i.e. in the semester immediately following that in which MMAN4010 Thesis A is taken. This course, together with MMAN4010 Thesis A, requires each student to demonstrate managerial, technical and professional skills in planning, executing and reporting on an approved engineering project within a stipulated time limit. Each student is also required to report on their project work at a thesis conference which is organised under MMAN4000 Professional Engineering. The project, on which each student works, will be a direct continuation of the project on which that student worked in MMAN4010 Thesis A. Each student is guided by a supervisor, but successfully completing the project, writing the thesis and submitting two hard copies together uploading a PDF file by specified deadlines are the sole responsibility of each student.

### **Laboratory Staff**

The laboratories are the responsibility of the staff-in-charge and you must operate within the accepted practices of the laboratory concerned. You should not expect laboratory staff to

take responsibility for your thesis or carry out work for you. The laboratory staff are highly skilled and helpful; take full advantage of their experience.

If your project involves laboratory work, contact the officer-in-charge (OIC) of the laboratory in which you will be working as soon as possible to discuss your requirements. They will issue you with a Laboratory Access Approval (LAA) form which you must complete and return to the OIC.

Before you start work in a laboratory or undertake any activity which might be considered hazardous in any way, you must read and understand the practices and procedures described in the OHS section of the School's website.

### **Workshop**

All student activities requiring manufacture in the Workshop should be discussed with the Workshop personnel at the inception of the work. The Workshop personnel must have the opportunity to advise and influence the design to help minimise assembly, manufacture or functional problems.

The Workshop is usually in high demand. If you require the Workshop to manufacture equipment essential to your thesis, then make sure that you discuss your requirements as early as possible with the Workshop/Laboratory Manager. You should provide engineering drawings which are first approved by the laboratory officer-in-charge. You should make every effort to minimise the Workshop load by modifying existing equipment rather than building from new, and by keeping your designs simple.

### **Safety Training**

A full list of safety training requirements for BE Thesis students is available on the School's website. Safety in any project is paramount and it is mandatory to complete risk paperwork for all activities. Always discuss with your supervisor what your plans are and what risk assessments will be required.

### **Thesis Submission**

The quality of the presented work is very important and great care must be taken with the typing and presentation of graphs and diagrams; drawings should be to standard engineering practice. Drawings submitted to the Workshop must be approved by the officer-in-charge of the relevant laboratory. The English should be clear and grammatically correct with a high standard of spelling and punctuation.

There is no strict minimum length for a thesis, nor is there a maximum length. We impose a soft limit of 100 pages and strongly recommend you aim for this. Appendices must be brief and should contain only material which is indispensable but at the same time cannot be included in the text.

## **CONFIDENTIAL THESES**

If your thesis contains confidential information, in order to restrict it from viewing for two years you must complete a Confidentiality Form, available from the School's BE Thesis Moodle Site, and submit this statement with your thesis. Confidential theses should not be uploaded to the database but should be submitted in all other required formats. Discuss submission with the Thesis coordinator.

## **PRODUCTION AND SUBMISSION SPECIFICATIONS**

All BE thesis students are required to submit copies of their thesis in the formats shown below. Students who do not submit as required will be denied graduation until the requirements have been met.

### **A. Two spiral-bound copies**

This copy will be returned to the author. The spine should be labelled with the author's initials and family name (a label is sufficient). Students may collect a copy from their supervisor after the MMAN4020 Thesis B results have been released. Copies not collected by the end of Week 1 in the following semester may be destroyed.

Your submission on Moodle indicates that the thesis is entirely your own original work, which is a binding statement.

### **B. One PDF copy through Moodle**

You **MUST** submit a PDF copy through the Thesis B Moodle page. Name this file 'z1234567\_Thesis', with '1234567' being your student ID number.

The submitted file should be less than 20mb – if you feel that your work would benefit from a larger, higher-res version, please submit this directly to your supervisor. The electronic version must have the copyright declaration included in it, as a scanned version of the signed original, though by your submission you will also agree that the work is all your own.

### **C. Data**

Your thesis mark will not be released until you have organised to pass on your thesis data to your supervisor. This can be dropbox, USB stick, hard drive – discuss with your supervisor. However it is now a legal requirement of research conducted at UNSW that the original data be archived, and so you must collate all the work that went into your thesis (drawings, excel files, CAD files, CFD/FEA result files, etc. – everything that went into creating your thesis, but not early work or dead-ends that did not make the cut). Your supervisor will mark this task complete on Moodle.

## **Specifications for Thesis**

Paper must be ISO size A4 (210 x 297mm).

Typing and may be double sided only if the paper is of sufficient quality that the other side is not showing through and interfering with the readability of the text. All text should be size 11 or 12 font Times New Roman or close equivalent serif font, apart from titles and figures.

Margins must be not less than 30 mm at the left and right edge (before binding), 30 mm at the upper edge, and 20 mm at the lower edge.

The thesis must include a title sheet headed:

UNSW AUSTRALIA

SCHOOL OF MECHANICAL AND MANUFACTURING ENGINEERING

(The above are not to be abbreviated. Do not insert the UNSW crest — this is not an official UNSW publication, and so is not entitled to use the crest.)

Title of Thesis

Name of Author

Student ID

Bachelor of Engineering (or other degree for which the thesis is submitted)

Date of submission (Month and Year)

Supervisor's name

All sheets must be numbered. The main body of the thesis must be numbered consecutively from beginning to end in Arabic numerals. The preliminary pages (Abstract, List of Contents, List of Figures, List of Symbols) should be numbered using lower-case Roman numerals, commencing with the title page (but not shown on the title page). Pages in appendices may be numbered consecutively from the main text, or may have their own numbering system.

Graphs, diagrams and photographs should be inserted as close as possible to their first reference in the. Graphs and tables which are printed in landscape format should be readable from the right hand side of the book.

Computer programs and prints of engineering drawings may be bound into the thesis in such a way that they unfold easily for reference, or they may be enclosed in a pocket at the rear of the thesis, in which case an itemised list of the contents of the pocket should also be bound into the thesis. Each loose item must be identified by the name of the author, the degree for which the thesis is submitted, and the year in which the thesis is submitted.

All quoted sources must be clearly referenced either at the end of the thesis with a key or on the page quoted.

### **Student Learning Outcomes**

This course is designed to address the below learning outcomes and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successfully completing this course, you should be able to:

| Learning Outcome |  | EA Stage 1 Competencies    |
|------------------|--|----------------------------|
| 1.               | Develop a design or a process or investigate a hypothesis following industry and professional engineering standards. | PE2.1, PE2.2, PE2.3, PE2.4 |
| 2.               | Critically reflect on a specialist body of knowledge related to their thesis topic.                                  | PE1.3                      |
| 3.               | Apply scientific and engineering methods to solve an engineering problem.  | PE2.1                      |
| 4.               | Analyse data objectively using quantitative and mathematical methods.  | PE1.2, PE2.1, P2.2         |
| 5.               | Demonstrate oral and written communication in professional and lay domains.  | PE3.2                      |

### 3. Teaching strategies

There is no formal teaching but the students learn from both internal and external sources. The supervisor, other academics and laboratory/workshop staff are the internal sources, whereas the Library, internet and industry mentors are the external sources.

### 4. Course schedule

There are no set lectures for this course.

### 5. Assessment

The Thesis B grade will be made up from

|  |     |
|--|-----|
| Thesis Conference                            | 10% |
| Thesis Conference extended abstract / poster | 5%  |
| Thesis Report                                | 85% |

For calculation of Honours, Thesis A is worth 25% and Thesis B is worth 75% of the total 12 unit course credit.

It is your responsibility to keep your project details (supervision, title, working abstract) up to date in the “your project details” section of Moodle.

**Thesis hard copies and electronic copies due Monday week 13, 5pm.**



Please submit your 2 hard copies in person to the Student Services Office (Ainsworth, Level 1), and your PDF copy through the Moodle Thesis B submission portal.

If you Fail in Thesis B, you have two options:

- re-enrol for Thesis A & B again with a new project and supervisor
- re-enrol for Thesis B again with the same project (needs consent of an appropriate supervisor & student)

### **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 components beside thesis document – zero (0) mark is awarded
- For thesis document – 5 marks off the thesis for every day late.
- Any thesis not turned in within 6 weeks after the deadline will be finalised at zero (0) marks.

### **Discrepancy amongst thesis marks**

Thesis marks will 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, and 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 fail within the 10 mark difference).

### **Special Consideration and Supplementary Assessment**

For details of applying for special consideration and conditions for the award of supplementary assessment, see [Administrative Matters](#), available on the School website and on Moodle, and the information on UNSW's [Special Consideration page](#).

## **6. Expected Resources for students**

No prescribed textbook. Students may find other resources on their particular project at the UNSW library:

<https://www.library.unsw.edu.au/servicesfor/index.html>

Content on the Moodle page will be updated often with tips and discussions and resources, so you are strongly advised to make sure you are able to receive updates.

## 7. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the Course and Teaching Evaluation and Improvement (CATEI) process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

In this course, recent improvements resulting from student feedback include revised marking schemes, Faculty-wide marking guidelines and Faculty templates.

## 8. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism: <https://student.unsw.edu.au/plagiarism> The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

<http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf>

Further information on School policy and procedures in the event of plagiarism is available on the [intranet](#).

## 9. Administrative Matters

All students are expected to read and be familiar with School guidelines and policies, available on the intranet. In particular, students should be familiar with the following:

- [Attendance, Participation and Class Etiquette](#)
- [UNSW Email Address](#)
- [Computing Facilities](#)
- [Assessment Matters](#) (including guidelines for assignments, exams and special consideration)
- [Academic Honesty and Plagiarism](#)
- [Student Equity and Disabilities Unit](#)
- [Health and Safety](#)
- [Student Support Services](#)

*A/Prof. Tracie Barber  
February 2016*

## Appendix A: Engineers Australia (EA) Professional Engineer Competency Standards

|  | <b>Program Intended Learning Outcomes</b>   |
|--|---|
| <b>PE1: Knowledge and Skill Base</b>             | PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals                          |
|  | PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing                 |
|  | PE1.3 In-depth understanding of specialist bodies of knowledge  |
|  | PE1.4 Discernment of knowledge development and research directions                                    |
|  | PE1.5 Knowledge of engineering design practice  |
|  | PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice |
| <b>PE2: Engineering Application Ability</b>      | PE2.1 Application of established engineering methods to complex problem solving                       |
|  | PE2.2 Fluent application of engineering techniques, tools and resources                               |
|  | PE2.3 Application of systematic engineering synthesis and design processes                            |
|  | PE2.4 Application of systematic approaches to the conduct and management of engineering projects      |
| <b>PE3: Professional and Personal Attributes</b> | PE3.1 Ethical conduct and professional accountability   |
|  | PE3.2 Effective oral and written communication (professional and lay domains)                         |
|  | PE3.3 Creative, innovative and pro-active demeanour   |
|  | PE3.4 Professional use and management of information  |
|  | PE3.5 Orderly management of self, and professional conduct  |
|  | PE3.6 Effective team membership and team leadership   |