UNSW SYDNEY | Australia's Global University

Mechanical and Manufacturing Engineering

Course Outline

Semester 1 2018

MECH9011

ME PROJECT A

Contents

1. Staff contact details

All academic staff, together with some senior engineers from industry, act as supervisors to students undertaking ME Project A. Support is also provided by the workshop and laboratory staff.

Contact details of the course convenor

Mr. David Lyons CEng FRINA MIEAust GCULT
Office location: Ainsworth J17 208D
Tel: (02) 9385 6120
Email: david.lyons@unsw.edu.au (email is the best way to contact me)

It is recommended you email the course convenor 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.

Contact details of the ME Project administrator

Name: Mr Jonathan Pritchard
Office location: Ainsworth J17 Level 1, Student Services Office
Tel: (02) 9385 4154
Email: jonathan.pritchard@unsw.edu.au

Contact Jonathan directly, with copy to the course convenor, if you have issues relating to your enrolment, progress, or other administrative queries.

Please see the course Moodle.

2. Important links

- Moodle
- UNSW Mechanical and Manufacturing Engineering
- Course Outlines
- Student intranet
- UNSW Mechanical and Manufacturing Engineering Facebook
- UNSW Handbook

3. Course details

Credit Points

This is a 6 unit-of-credit (UoC) course, and involves an unprescribed number of contact hours per week (h/w) with your supervisor. This varies on a case-by-case basis, as agreed with your supervisor.

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work. Thus, for a full-time enrolled student, the normal workload, averaged across the 16 weeks of teaching, study and examination periods, is about 37.5 hours per week.”

Thesis differs. Various factors, such as your own ability, your target grade, etc., will influence the time needed in your case.

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 thesis.

Summary and Aims of the course

ME Projects A and B lead to completion of a thesis report and are 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 project 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.

This course—together with MECH9012 Project B, which is to be taken in the following semester—requires each student to demonstrate managerial, technical and professional skills in planning and executing an approved engineering project within a stipulated time limit. Each student is guided by their supervisor, but successfully planning, executing and reporting on the project 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 intranet: https://eng-intranet.unsw.edu.au/mech-engineering/whs/SitePages/Home.aspx

Workshop

All student activities requiring manufacture in the Mechanical and Manufacturing Engineering (MME) 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 very 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 intranet. 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

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

4. 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.

5. Course schedule

There are no set lectures for this course, but a number of workshops will be provided to assist students to complete their thesis to a high standard. The date and time of the workshops will be announced on Moodle and by email. All workshops will be recorded and made available to students on Moodle.

6. Assessment

The final grade for Thesis A will be made from:

Project A Progress Report	80%
Project A Presentation	20%

It is your responsibility to keep your project details (supervision, title, working abstract) up to date in the “your project details” section of Moodle. If you do not have information in there or the supervisor name is incorrect, your progress report will not get assigned for marking.

You are required to provide the final details (title, supervisor, abstract) of your project on Moodle **Friday 5pm, Week 12**. Failure to do so will incur late penalties, as your report will not be allocated for marking.

Progress Report: **due Monday Week 13, 5pm**

Please submit your Progress Report electronically, directly through the portal which will be made available on the ME Project A Moodle.

The supervisor will assess the report and grade the work; in order to progress to MECH9012 ME Project B, the grade must be greater than 50% as a course total. The supervisor will provide feedback on the student's progress, and may ask for additional material (i.e. expanded literature review). It is up to you to discuss with your supervisor the exact content of the report, but ideally it should be based on the template that will be made available on Moodle.

Project A progress (interim) report marking rubrics

Criteria 1: Reviewing the work of others (30%)

Grade	Mark	Brief description	Explanation/Examples
Fail	0 – 14	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	15 – 18	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. i.e., are there significant holes in this review?
Credit	19 – 22	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.
Distinction	23 – 26	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. i.e., the student makes intellectual connections between the different parts of the review and puts their work in context.
High Distinction	27 – 30	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.

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

Grade	Mark	Brief description	Explanation/Examples
Fail	0 – 9	Broad context missing.	The research question is not explained, and there is 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).
Pass	10 – 12	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.
Credit	13 – 15	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.
Distinction	16 – 18	Broad context present. Specific logical plan. Plan fits the review narrative.	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. 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.
High Distinction	19 – 20	Broad context present. Specific and robust logical plan. Plan fits the review narrative.	The plan is robust and has provision for project variations and contingencies. 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.

Criteria 3: Document presentation (10%)

Grade	Mark	Brief description	Explanation/Examples
Fail	0 – 4	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	5	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.

Grade	Mark	Brief description	Explanation/Examples
Credit	6 – 7	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.
Distinction	8 – 9	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.
High Distinction	10	Professional, concise and readable	Everything from above, plus text is clear and concise. Graphical presentation of data is appropriate, clear and economical.

Criteria 4: Thesis progress (40%)

Grade	Mark	Brief description	Explanation/Examples
Fail	0 – 19	Minimum progress	Very little actual work has been completed, perhaps laboratory inductions or some introductory demonstrations only.
Pass	20 – 24	Minor work completed	Some work complete on research project, but does not look like one session worth of work. Some simple preliminary work conducted.
Credit	25 – 29	Start on project	Preliminary work completed and project looks at a stage where it can be completed in time. Initial work has been completed to allow the significant work to take place in Thesis B.
Distinction	30 – 34	Good work conducted, real progress made	Real progress made with some results already being found. Preliminary work all completed and well into the research component of the project.
High Distinction	35 – 40	Excellent progress	Good sets of results being found, and clearly on track for completion of significant work during Thesis B.

Project A presentation

Between **Monday Week 12 (21 May) to Friday Week 13 (1 June)**, the student must present their thesis progress to their supervisor. You will need to book a time with your supervisor and complete a 10 minute presentation face-to-face. Alternatively, by prior agreement with your supervisor, your Project A presentation may take the form of a to-camera video, uploaded to YouTube (with appropriate privacy settings). Please discuss with your supervisor.

Project A presentation marking rubrics

Aspect 1: Presentation skills (25%)

Criteria	Grade
Did the presenter speak with clarity (volume, speed, enunciation)?	/5
Did the presenter speak in an engaging way (tone, passion)?	/5
Did the presenter engage the audience (eye contact, body language)?	/5
Did the presenter deliver in a relaxed, confident manner?	/5
Did the speaker make good use of well-designed visual aids?	/5

Aspect 2: Knowledge base (25%)

Criteria	Grade
Was proper background information on the topic given?	/5
Was the material selected for presentation appropriate to the topic?	/5
Was enough essential information given to allow the audience to effectively evaluate the work done in context?	/5
Was the talk free of irrelevant or filler information?	/5
Did the presenter demonstrate a clear understanding of the material presented?	/5

Aspect 3: Critical thinking & planning (30%)

Criteria	Grade
Did the approach to the work so far demonstrate thought and planning?	/5
Were the strengths and weaknesses of the work, and the methods used to gather evidence/data, clearly explained?	/5
Did the presenter demonstrate they had completed progress on their topic?	/5
Did the presenter have a solid plan in place for completing their project?	/5
Has the presenter thought about possible delays/problems that may arise?	/5
Did answers to questions show an understanding of the project and background?	/5

Aspect 4: Overall impression (20%)

Criteria	Grade
Overall impression of the presentation	/20

Consequences if you fail in Project A and B

If you Fail in Project A, you must re-enrol in Project A again in a future semester.

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

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

Late Procedure

In all cases, applications for late submission must be applied for, in advance of 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. Penalty applies until the marks for the course decrease to 50, and further lateness does not result in failure of the course, but might be a failure of the thesis (weekends count as days).
- Any thesis not turned in within 6 weeks after the deadline will be finalised at zero (0) marks.

Special Consideration and Supplementary Assessment

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

7. Expected resources for students

Of course, there is no prescribed textbook.

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

Students may find other resources on their particular project at the UNSW library: https://www.library.unsw.edu.au/

8. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the myExperience 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.

9. 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: 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: 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.

10. Administrative matters and links

All students are expected to read and be familiar with School guidelines and polices, 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

David Lyons
ME Project course convenor
2 Feb 2018

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

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