



Mechanical and Manufacturing Engineering

# Course Outline

Term 1 2019

**MMAN9001**

**MASTER OF ENGINEERING SCIENCE  
PROJECT A**

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# 1. Staff contact details

## Contact details and consultation times for course convenor

Name: Dr Ron Chan

Office Location: Room ME507, Ainsworth Building

Tel: (02) 9385 1535

Email: [r.chan@unsw.edu.au](mailto:r.chan@unsw.edu.au)

Moodle: <https://moodle.telt.unsw.edu.au/login/index.php>

It is recommended you email the course convenor to make a specific appointment if you need to discuss any important issues. Always consult the course Moodle first in case your questions have already been answered.

## Contact details and consultation times for additional lecturers/demonstrators/lab staff

You will be working in groups with the assistance of a **Mentor**. Please see the course [Moodle](#) for details of your group allocation and Mentor contact details.

# 2. Important links

- [Moodle](#)
- [Lab Access](#)
- [Computing Facilities](#)
- [Student Resources](#)
- [Course Outlines](#)
- [Engineering Student Support Services Centre](#)

# 3. Course details

## Credit points

This is a 6 unit-of-credit (UoC) course and involves a variable number of hours per week of face-to-face and online contact with your Mentor and your group members, combined with online Moodle supports.

## Contact hours

Please refer to the Moodle Group Forum (MGF) set up for your group for details of face-to-face contact with your Mentor and other group members, online interaction and related activities. Regular and ongoing visits to, and interaction with, the MGF and attendance at group meetings with the mentors is expected in this course.

## Summary and Aims of the course

Master of Engineering Science Project allows each student to work under the guidance of

academic staff and Mentors with input from technical (industry/research/practitioner) specialists. Topics are related to projects selected from contemporary practice. The work involves research-based investigations, industrial problems and design applications.

This course enhances the student’s skills for undertaking scholarly enquiry by attempting to achieve a specific topic objective within a defined period of time. A significant component of the course relates to the review of literature, which promotes independent and reflective learning as well as increases students’ capacity to develop information literacy. The project report is expected to reinforce the student’s ability and confidence in the written communication of technical information. Verbal presentation skills are tested during presentations and at group meetings.

This course is the first of two parts and is undertaken before MMAN9002 Master of Engineering Science Project B next term. The thesis involves formulating the designs for and solutions to open-ended engineering problems called **Common Interdisciplinary Open-Ended Projects<sup>1</sup> (“CIOP”)**. The problems will be drawn from contemporary practice and will be multi-disciplinary, involving the application of material learnt throughout your undergraduate program and will require a lot of creative thought. Project A includes the formulation of a Progress Report, which includes a review of the relevant literature and other professional engineering documents.

**The full text of the four CIOP Briefings for T1-2019 are posted on the course Moodle:**

**Humanitarian • Energy • Health • Transportation**

The group project is to be completed in two consecutive trimesters during the last academic year before graduation. It is not the responsibility of the course coordinator or Mentor to tell the student what to do, nor should it be assumed that your Mentor is an expert in all areas of engineering. Your Mentor is there to offer guidance and advice, as are other staff in the School (you should always seek an appointment by prior arrangement) that may have expertise in the area of your project. The successful execution of the project is solely the responsibility of the student.

**Student learning outcomes**

This course is designed to address the learning outcomes below 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. Conduct independent research and apply established theories to address an engineering problem that does not have a well-defined solution	PE2.1, 2.3, 2.4, 3.3

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<sup>1</sup> You will be placed in a group that will practice in one of four CIOP sectoral areas:  
**Humanitarian • Energy • Health • Transport**

Learning Outcome		EA Stage 1 Competencies
2.	Analyse critically, reflect on and synthesise complex information, problems, concepts and theories.	PE2.1, 2.3, 2.4
3.	Interpret and transmit knowledge, skills and ideas to specialist and non-specialist audiences.	PE2.4, 3.2, 3.4
4.	Demonstrate managerial skills and individual responsibility to complete a project within limited time and resources.	PE3.4, 3.5, 3.6

## 4. Teaching strategies

Online advice and strategies to assist your independent project work will be provided via Moodle. Student groups are expected to meet their Mentors face-to-face, to provide updates on progress and to seek feedback and guidance. Your team needs to submit 'evidence of progress' weekly on your Moodle Group Forum (MGF) prior to your meeting with the mentors. Attendance to the face-to-face meeting with the mentors and contribution is mandatory.

## 5. Course schedule

Week	Expected Task Completion: Upload ' <b>Deliverables</b> ' to your Moodle Group Forum (MGF) weekly. <b>Deliverables</b> are tasks that must be completed and are assessed.
Week 1	<ul style="list-style-type: none"> <li>Be allocated to a project group in Moodle</li> <li>Read the course outline and your CIOP Brief (see Summary and Aims of the Course). CIOP Briefs will be posted on Moodle.</li> </ul>
Week 2-4	<ul style="list-style-type: none"> <li>Group to propose: A <b>methodology</b> in response to your CIOP and post to your MGF</li> <li>Select and post on MGF, a notice of who is your group's Project Manager</li> <li>Had <u>at least</u> one group meeting (can follow on from Mentor meeting), to: <ul style="list-style-type: none"> <li>Exchange contact details with your team members and set up a communication protocol</li> <li>Assign a role/title ("<b>Portfolio</b>") for <u>each</u> group member, eg: Project Manager to organise meetings; Enforce meeting attendance; Resolve team conflicts, a CAD specialist(s), a group minute-taker/record keeper, a Business Manager to maintain adherence to the project Gantt timeline, MATLAB specialist(s), coding specialist(s) etc. Note – some Portfolios can be shared, eg CAD if many drawings are expected. Also see <a href="https://student.unsw.edu.au/groupwork">https://student.unsw.edu.au/groupwork</a></li> </ul> </li> <li>Had one group meeting <u>with your Mentor</u> to discuss: <ul style="list-style-type: none"> <li>Your group's interpretation of your CIOP</li> <li>Your group's proposed <b>methodology</b></li> <li>Keywords for the literature research to examine CIOP prior knowledge</li> </ul> </li> <li><b>Deliverable:</b> Post an individual written introduction of yourself on your Moodle Group Forum (MGF) outlining your engineering skillsets and interests</li> <li><b>Deliverable:</b> Identify any lab training/inductions required and action</li> <li><b>Deliverable:</b> Identify roles of each team member i.e. who is the project manager? Who is the minute-taker? Who is the CAD specialist(s)? Who is the finances specialist(s)? etc.</li> <li><b>Deliverable:</b> Document your CIOP draft methodology – priority!</li> <li><b>Deliverable:</b> Decide on any lab resources needed.</li> <li><b>Deliverable:</b> Draft a project task timeline (Gantt) and post to MGF</li> </ul>

Week	Expected Task Completion: Upload ‘ <b>Deliverables</b> ’ to your Moodle Group Forum (MGF) weekly. <b>Deliverables</b> are tasks that must be completed and are assessed.
Week 5-7	<ul style="list-style-type: none"> <li>• Had <u>at least</u> one group meeting, to discuss: <ul style="list-style-type: none"> <li>○ State of available literature for your project</li> <li>○ Technical challenges and how you are addressing them in your Portfolio. Disciplinary skills to be employed e.g. CAD, MATLAB, coding etc.</li> <li>○ Time management</li> <li>○ Resources required to complete the project</li> <li>○ Any issue with group members’ performance: attendance, communication, effort, etc.</li> <li>○ Conduct of a survey (if any)</li> <li>○ Designs of experiments (if any)</li> <li>○ Laboratory safety and training issues (if any)</li> <li>○ Purchase of resources (if any). Note: UNSW budget to be confirmed, may be \$0 in which case at students’ own cost</li> </ul> </li> <li>• Had one group meeting <u>with your Mentor</u> to discuss: <ul style="list-style-type: none"> <li>○ All of the above</li> </ul> </li> <li>• <b>Deliverable:</b> Document your refined CIOP draft methodology – priority!</li> <li>• <b>Deliverable:</b> Literature survey by each individual member – this may be assessed individually, so please ensure to state the contributor of each part of the work – priority!</li> <li>• <b>Deliverable:</b> All key items discussed in your group meetings.</li> </ul>
Week 8-9	<ul style="list-style-type: none"> <li>• Had one group meeting to discuss: <ul style="list-style-type: none"> <li>○ Table of contents for your final <b>Progress Report</b> – write draft this week</li> <li>○ Update on resources to be purchased (if any), and decision whether to proceed and who pays</li> <li>○ Outline of <b>Progress Report</b></li> </ul> </li> <li>• Had one group meeting <u>with your Mentor</u> to discuss: <ul style="list-style-type: none"> <li>○ All of the above</li> </ul> </li> <li>• <b>Deliverables:</b> (1) Table of contents; (2) Outline of <b>Progress Report</b>: chapter headings and chapter authors; (3) A contingency plan for late receipt of results, resources, lab facilities, testing, group absences etc.</li> </ul>
Week 10	<b>Progress Report</b> submission via Moodle. Each group member responsible for a chapter, identified with author’s name. Further details: refer to Moodle.

**Note: some details of the Course Schedule are subject to alteration to suit exigencies. Updates will be posted on the course Moodle.**

# 6. Assessment

## Assessment overview

Assessment	Group Project?	If Group, # Students per group	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
Face-to-Face Progress Evaluation with Mentors	Yes	6 to 7	3 meetings per term	15%	1 to 4	See marking rubrics on Moodle	Friday Week 5, 8, and 10	N/A	Instant feedback from the mentors
Deliverables to Moodle Group Forum (MGF)	Yes	6 to 7	3-fortnightly deliverables per term	15%	1 to 3	See marking rubrics on Moodle	Friday Week 5, 8, and 10	One week after due date	One weeks after submission
Progress Report	No	Approx. 10 (tbc)	15-20 pages + front & end matter <sup>2</sup>	70%	1 to 4	See marking rubrics on Moodle	Submission: 5pm Fri Week 10 via Moodle	One week after due date	Upon release of final results

Updates to any aspects of Assessment will be posted on the course Moodle.

<sup>2</sup> [http://users.clas.ufl.edu/msscha/uwp/rsrchreport/front\\_end.html](http://users.clas.ufl.edu/msscha/uwp/rsrchreport/front_end.html)

## Assignments

### *Presentation*

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 due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

### *Submission*

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of 20 percent (20%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day.

Work submitted after the 'deadline for absolute fail' is not accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These are clearly indicated in the course outline, and such assessments receive a mark of zero if not completed by the specified date. Examples include:

- a. Weekly online tests or laboratory work worth a small proportion of the subject mark, or
- b. Online quizzes where answers are released to students on completion, or
- c. Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
- d. Pass/Fail assessment tasks.

### *Marking*

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.

### *Mentor and Peer assessment*

To ensure that all students participate equitably in group tasks, there will be a **Mentor and Peer Review** process whereby each student will be evaluated by their group's Mentor and every member of their team in a Moodle workshop. **The results of this Peer Review can affect your final mark.** Details of this process will be made available on *Moodle*.



### *Acknowledging the work of others*

All quoted sources must be clearly referenced in a Bibliography at the end of all written work using a single referencing system (e.g. <https://student.unsw.edu.au/apa>). In-text citation and referencing of all figures, tables and diagrams etc. that are taken from other works must be undertaken in full compliance with the chosen single referencing system (see 9. *Academic honesty and plagiarism*). If in doubt, consult <http://www.lc.unsw.edu.au/>

### **Examinations**

There is no examination in this course.

### **Special consideration and supplementary assessment**

If you have experienced an illness or misadventure beyond your control that has interfered with your assessment performance, you are eligible to 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](#).

## **7. Expected resources for students**

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

In addition:

UNSW Library website: <https://www.library.unsw.edu.au/>

Moodle: <https://moodle.telt.unsw.edu.au/login/index.php>

## **8. Course evaluation and development**

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

This course has moved to a new group project format for T1-2019.

## **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, visit: [student.unsw.edu.au/plagiarism](http://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](http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

## 10. Administrative matters and links

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](#)
- [UNSW Email Address](#)
- [Computing Facilities](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)
- [Academic Honesty and Plagiarism](#)
- [Student Equity and Disabilities Unit](#)
- [Health and Safety](#)
- [Lab Access](#)
- [Makerspace](#)
- [UNSW Timetable](#)
- [UNSW Handbook](#)
- [UNSW Mechanical and Manufacturing Engineering](#)

17 Feb 2019

# Appendix A: Engineers Australia (EA) Competencies

## Stage 1 Competencies for Professional Engineers

	<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