



Course Outline

Semester I 2017

ENGG1000

Engineering Design and Innovation

1. Staff Contact Details

***Course Convenor
and Lecturer***

Dr Chris Menictas
Room 402F

2. Course Details

Credit Points

ENGG1000 is a 6 Units-of-Credit (UoC) course with nominally 5 hours per week of face-to-face contact.

The myUNSW website states that “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 average workload across the 16 weeks of teaching, study and examination periods equates to approximately 37.5 hours per week.”

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 (h/w) 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. 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, i.e. an additional 5 h/w of your time.

Contact hours

	Day	Time	Location
Lectures	Monday	2-4pm	Please refer to your timetable and Section 4 of the course outline
	Thursday	2-3pm	

Mentoring	Monday or Thursday	4-5pm
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3.	Understand the basic elements of project management and be able to plan and schedule work activities in accordance with standard practice	PE3.4, PE3.5
4.	Become familiar with the tangible elements of mechanical and/or electrical design:	PE1.5, PE2.3
5.	Be able to convey your thoughts and ideas effectively in an engineering design report	PE3.2

What You'll Practise in ENGG1000

- By solving a substantial, open-ended problem, ENGG1000 directly builds skills in innovation and creativity.
- By requiring background research in the design proposal, ENGG1000 advances information literacy and the appreciation for the role of research in design.
- By providing mentoring rather than a structured solution process, ENGG1000 improves your capability for independent and collaborative enquiry, and encourages independent, self-directed learning typical of graduate engineers, who recognize the need for lifelong learning.
- By engaging in engineering design in a team, ENGG1000 builds your experience as a collaborative team worker, and gives opportunities for leadership.
- By focusing on technical report writing and technical presentations, ENGG1000 directly advances your communication skills, in particular your ability to convince others to accept designs, innovation, and analytical results.
- By requiring technical learning as background to the solution of the design problem, ENGG1000 requires you to apply your technical knowledge and skills to the problem-solving process.
- By requiring you to peer-review other submissions from your class, E6.6(h), 10.6(tB1.315), -6.6(1) TJ 0.0

3. Teaching Strategies

Although other courses in your degree may vary in their teaching strategy, your understanding of and ownership of the learning process developed in the ENGG1000 Project will prove invaluable for the remainder of your degree program. The Project consists of lectures, labs and tutorials.

The teaching strategies that will be used in this Project include:

Tables M and T that follow are a guide to which activities occur when. Note that the schedule shown here on may be subject to change at short notice to suit exigencies.

Please check Moodle for the latest announcements.

Table T: Rough schedule for Thursday's activities (current 08FEB17).



Note: TAFE training schedule will be provided separately

5. Assessment

Assessment overview

Assessment in this course consists of a mixture of individual and team assessments. The following table illustrates a breakdown of each assessment task for the above assessments.

Current 08 February 2017

Task	Assessment Area	Activity	Weight	
			Individual	Team
T1	N/A	Project Selection	-	-
T2	N/A	Team Builder	-	-
T3	Written Reflection	Impromptu Design	5	-
T4-A	N/A	Team Introductions	-	-
T4-B		Training at TAFE	10	-
T5-A	Written Reflection	Phase 1	0	-
T5-B	("Learning Portfolio")	Phase 2	5	-
T5-C		Phase 3	5	-
T6-A	Technical Steam	Hardware Lab 1/3	10	-
T6-B		Hardware Lab 2/3	10	
T6-C		Hardware Lab 3/3	10	
T6-C		Best 2 of 3 lab marks (10% each)	20	-
T7-A	Design and Planning	Design Proposal	-	10
T7-B		Presentation	-	5
T8	Design and Build	Compliance Testing	-	5
T9				

Unlike most of your courses in engineering, this course has a high degree of continuous assessment – rather than having the majority of assessment weighted as a final exam or assignment, this course has many assessment tasks due regularly throughout the entire session. The rough due dates for each assessment are indicated on the schedule (see Table T), and you can see from this that there are assessment tasks due regularly throughout the semester.

The total course mark consists of 50% individual and 50% team marks. To ensure that all students participate equitably in team assessments, there will be a Peer Review process whereby each student will be evaluated by every member of their team. The results of this Peer Review will determine your final team mark. The Peer Review component will constitute a maximum of 50% that may be subtracted from your team mark. That is, you stand to lose up to $(50/100 \times 50 \text{ marks})$ 25 marks from your total course marks for non-participation in team assessment activities.

Note: There are three hardware labs as part of the Technical Stream (Task T6), the best two out of three hardware lab marks will be taken for your assessment.

Summary of Assessment Tasks

Detailed descriptions of the assessment tasks for this course – in particular the Project – will be posted on Moodle closer to the time of the assessment. In the meantime, the following is an overview:

T1 Project Selection

You will be required, on Moodle, to select in which Project you will work for the duration of Session.

T2 Team Builder

The Team Builder activity is in the form of a survey to evaluate your knowledge of engineering design and its related activities as you begin the Project. Your honest answers will help place you in a well-balanced team for the duration of the Project.

T3 Written Reflection of the Impromptu Design Activity

“Reflection” in this context is a form of personal response to experiences, situations, events or new information. It is like a “processing” phase where thinking and learning take place. The examination of your beliefs, attitudes and assumptions forms the foundation of your understanding.

This writing thus involves revisiting your prior experience and knowledge of the topic you are exploring. Then, as a way to achieve clarity and better understanding of what you are learning, you will compare how these relate to the current topic within the Project. You will sum-up questions you may and conclusions you have drawn.

This particular assessment is in the form of a short essay-style written assignment administered by The Learning Centre. Contact Ms Pam Mort (p.mort@unsw.edu.au) for issues pertaining to this assessment task.

T4 Team Introduction and Hand Tool Training

T4-A consists of meeting your groups and completing a team contract.

T4-B will be conducted at Ultimo TAFE and will consist of exercises and short assessments related to the safe and effective use of engineering hand tools needed for constructing your design prototype. This activity must be completed for you to be allowed access to the construction labs.

T5 Learning Portfolio with Calibrated Peer Review

These assessment tasks are further exercises in written reflection:

- The first part of each of the three tasks requires a short essay-style written assignment where you reflect on your team’s work relating to the three phases of the Design Process.

- In the second part you will review some submissions by students in previous years – some good and some not so good. Using these texts you will “calibrate” how you grade your peers’ submissions.
- Having calibrated your own personal marking scheme with the conventions, you will undertake a critical analysis of the written work of your peers. The critical analysis carried-out by your peers will contribute to your marks but will also give you valuable feedback regarding your approach to the Project.

In addition, each student is required to keep a Design Journal (described in more detail later), keeping a written record of your thoughts on the design problem in your formation. This journal is marked by your mentor during the mentor session, and is one-fifth of the marks for this assessment (that is, 5% of your final grade).

T6 Technical Stream Assessment

A total of 20% of your course mark is drawn from work assessed in the Thursday technical labs. Three Hardware Labs will be run, each worth up to 10%, the best two out of three marks will be taken as the technical stream assessment. No preparation is required before attending the Labs although you must wear covered shoes.

T7 Design and Planning

This group of tasks assesses your planning and general design solution for the major Project. It has three components:

- T7-A: You will submit a design proposal for your prototype. The proposal will be in the form of a professionally formatted engineering report that summarises the first three design phases with a project plan, budget estimate, and preliminary test results (if any). This is a sufficient design description package that could be handed over to a client if required. The total length of the report will be around 10 pages.
- T7-B: You will present your design to your mentors and lecturer. This will be a short 10-15 minute verbal presentation of the team

6. Expected Resources for Students

Web-based Resources

Learning Management System

The electronic Learning Management System (LMS) will be your main source of day-to-day information regarding administration of the course and Project. Moodle is an on-line learning environment where you can collaborate in discussion groups and acquire the necessary information to complete your assignments through interaction with lecturers, mentors and your peers: <http://moodle.telt.unsw.edu.au>

After you reach this page, login using your student number (zXXXXXXX) and your zPass.

Course Web-sites

The main website for this course, Moodle, will contain lecture notes, discussion forum, and assignment submission. There is another website that will also be used in this course for assessment, for which you will also need accounts: this is WebPA. A link can be found on the course Moodle page.

- Long hair and loose items of clothing, such as unbuttoned long sleeves, untucked or unbuttoned shirts or jackets and scarves are a safety hazard and have caused many serious injuries. You will not be using heavy rotating machinery in this course but please get into the habit of wearing safe clothing in laboratories and workshops.
- The “Introduction to Laboratory Safety” (ILS) will emphasise all these.

Resource Documents

Watch Moodle for the release of lecture slides and other resource material related to the topics presented in lectures.

The UNSW Library

To learn more about the fantastic resource that is the UNSW Library, start here:

www.library.unsw.edu.au

Hardware Stores

Mitre10, Bunnings, Jaycar and other useful shops are all located in close proximity to UNSW.

7. Course Evaluation and Development

The course has been completely redesigned in 2015 and will be evaluated at the end of this semester. Feedback on the course is gathered periodically using various means, including the myExperience process, informal discussion in the final tutorial class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual

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

	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