UNSW AUSTRALIA

Course Outline

Semester 1 2015

Never Stand Still | Faculty of Engineering | School of Mechanical and Manufacturing Engineering

ENGG1000

Engineering Design and Innovation

Contents

1 Staff Contact Details

1.1 Course Staff

Course Convenor and Lecturer	Dr Chris Menictas Room 464C Mechanical and Manufacturing Engineering (4th Floor Electrical Engineering Building G17) c.menictas@unsw.edu.au 02 9385 6269
Mentors	The contact details of your Mentors will be distributed by the Mentors once you have been assigned to one of their groups.

1.2 Consultation

Your first point of contact is your Mentor. Each design team will be assigned a student Mentor to help guide the team throughout the Project. These mentors are all students who have been very successful in previous design courses and have a wide range of skills and experiences that will, if properly utilised, assist your team to achieve a successful Project outcome. *Consultations with your mentor outside of your scheduled time can be made by mutual arrangement.*

If your problem can't be rectified by your mentor then approach your Project Convenor. The work of an academic is irregular in its nature and meetings are often called at short notice. As-such, your Project Convenor is unlikely to have regular consultation times but, if they are in their office and your approach is polite, they can probably give you a minute or two.

If your enquiry is of a general nature, post it on the Course or Project Forum on *Moodle*: https://moodle.telt.unsw.edu.au.

One-on-one e-mail should be used as a last resort since it is an inefficient use of everyone's time.

2 Course Details

2.1 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.

There is no parallel teaching in this course.

2.2 Pre-requisites

Nil.

2.3 Summary of the Course

2.3.1 Background – What the Course is About

Engineers solve problems. These problems can range from rather simple ones such as how to keep a door from blowing open on a windy day to highly complex ones such as how to land an unmanned spacecraft on the surface of a distant planet. You might ask what could these two vastly different types of problems have in common? The answer is simple: Design. Design, however, is anything but simple and it can take an entire lifetime to master.

Design is the act of creating solutions to problems. Often we are asked to design an improvement to an existing solution where that new solution can be somewhat predictable - for instance, the next facelift of an existing motor vehicle. Yet, to be competitive engineers, we must strive to look at each problem with a view to innovation. What new technologies, materials and techniques can we bring to bear on the problem – and how can we do this whilst ensuring that we can deliver our solution within real cost and time constraints?

Engineering activity usually results in the creation of a tangible artefact, produced to satisfy human needs. This artefact comes into being through a systematic process of decision

making and activities called the engineering design process. If the artefact is complex (think of an aircraft), knowledge and skills from many diverse engineering disciplines will be needed by the designers to make the design successful. A study of these diverse disciplines of engineering science will occupy much of your time in later years. So as to be able to effectively use the science you learn in those courses, you will need some basic introductory skills and knowledge of engineering product design. This is the focus of the lectures and tutorials in this course and in the area of Design in general.

2.3.2 Specific Aims of the Course

Essentially, during Semester we will:

1. Introduce you to the principles and methods of engineering design.

We will focus on the skills, concepts and methods needed to design innovative solutions to Engineering problems. We will look at Design as a multi-faceted activity which requires considerable creativity, sound decision making and problem solving skills as well as excellent interpersonal and communication skills. The problem solving and project management skills that you hone here will be invaluable for later courses in your degree.

2. Involve you in a number of hands-on design and engineering activities.

You will get the opportunity to demonstrate your competency at these skills by experiencing first-hand what is required to design, build and test your solution to an interesting design problem in the same way that professional engineers all over the world are doing right at this moment.

3. Provide a team-based environment so you can experience and learn collaborative skills.

For the work in the Project, everyone will be assigned to a team for the duration. Most of the activities and assessments in this course will be conducted through the team although individual performance will be monitored and assessed as it would be in industry. Make use of the wide range of experience within your team - you are all well-educated and capable and there is much you can learn from one another.

2.4 Graduate Attributes

UNSW aspires to develop graduates who are:

1. Rigorous scholars,
2. Capable leaders,
3. Professionals and
4. Global Citizens.

The University has, thus, articulated a comprehensive list of Graduate Attributes (GAs) as desired learning outcomes for all UNSW students. The full list, comprising sub-sets of the above four broad areas, may be found here:

https://my.unsw.edu.au/student/atoz/GraduateAttributes.html

The core GAs which we develop in ENGG1000 are:

- Scholars who are able to apply their knowledge and skills to solving problems (GA 1d).
- Scholars who are capable of effective communication (GA 1f).
- Leaders who are collaborative team workers (GA 2c).
- Professionals who are capable of independent, self-directed practice (GA 3a).
- Global Citizens who are culturally aware and capable of respecting diversity and acting in socially just/responsible ways (GA 4b).

2.5 Student Learning Outcomes

Upon completion of ENGG1000, you will be expected to have the following capabilities.

1. Demonstrate an understanding of the process of engineering design and the use of design methods for:
   a) Defining an open-ended design problem,
   b) Generating alternative and innovative conceptual solutions and
   c) Evaluating these solutions (GAs 1c, 1d, 2a and 3a).
2. Understand the dynamics of collaborative teams and how to work effectively within a team to accomplish tasks within given deadlines (GAs 1e, 1f, 2c and 4b).
3. Understand the basic elements of project management and be able to plan and schedule work activities in accordance with standard practice (GAs 1d, 2e, 3a and 3c).
4. Become familiar with the tangible elements of mechanical and/or electrical design:
   a) Demonstrate the safe and effective usage of basic workshop tools or basic electronic test equipment and

b) Recognise some basic engineering materials, devices and mechanisms which form the "building blocks" of much of the world's machinery and circuitry (GAs 1a, 1g and 3b).

5. Be able to convey your thoughts and ideas effectively in an engineering design report (GAs 1c, 1f, 1g, 1h and 3c).

2.6 What You'll Practise in ENGG1000

- By solving a substantial, open-ended problem, ENGG1000 directly builds skills in innovation and creativity (GA 2a).
- By requiring background research in the design proposal, ENGG1000 advances information literacy and the appreciation for the role of research in design (GA 1g).
- 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 (GA 1b, 3a and 3b).
- By engaging in engineering design in a team, ENGG1000 builds your experience as a collaborative team worker, and gives opportunities for leadership (GA 2c).
- 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 (GA 1f).
- 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 (GA 1d).
- By requiring you to peer-review other submissions from your class, ENGG1000 helps you to sharpen your analytical skills (GA 1c).
- By setting design tasks that involve multiple engineering disciplines, ENGG1000 helps you to understand your discipline in its interdisciplinary context, and helps you to understand how skills from one engineering discipline can be transferred to other disciplines (GA 1a).

2.7 Expectations of Students

UNSW expects regular attendance at lectures and tutorials/laboratory classes/seminars. *Although exceptions may be made for special circumstances, we do expect University commitments to take precedence over regular work activities, holidays etc. This is how it is in industry.*

UNSW has rules for computer use, for example, for e-mail and online discussion forums. You will have to agree to them when you first access the UNSW network.

We expect everyone – staff and students – to treat each other with respect.

3 Rationale for the Inclusion of Content and Teaching Approach

The philosophy which underlies the structure of this course is based on making problem solving knowledge and skills explicit, rather than implicit. *The basis for this approach is that if you are aware of how you solve problems you can improve your effectiveness over time in a clear and systematic manner*. This behaviour is intrinsic to effective engineering.

Because good designers also rely on their intuition and experience, the course provides many experiential activities *with emphasis on reflection on the design process.* This is because design is an extremely broad activity that is best learnt by *doing*. The life of a graduate engineer is full of experiential learning; the differences in this university course are that you will formally learn about the design process and you will reflect on your understanding of it as you go.

This is a learner-focused course, which requires you to take responsibility for your own learning. You will work together in teams to design a solution to a specified but open-ended problem. In industry, you seldom choose your workmates and you won't here either. For the work in the Project, everyone will be assigned to a team for the duration. Most of the activities and assessments in this course will be conducted through the team although individual performance will be monitored and assessed as it would be in industry.

This Project will be supported with a variety of additional student experiences to help you acquire individual and group skills in areas needed for communicating the design, including graphical representation, collaboration, report writing and any necessary technical knowledge.

4 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:

- Presentation of the material in **Lectures** so that you gain an understanding of the underlying concepts that will be needed to perform your assignments and develop your major design Project.

  The lectures will provide the rationale for the design process followed in the course and some basic engineering principles to act as a starting point for addressing the Project's design brief. The labs and tutorials are intended to provide guidance on your self-directed path of discovering the relevant information and skills needed to successfully complete the Project.

- The provision of experienced design **Mentors** who will provide face-to-face feedback and advice on your progress through the Project and your understanding of engineering design, project management and team development skills.

- Your completion of individual **Tutorials** (Mentoring classes) and group **Assignments** that will give you the opportunity to demonstrate your understanding of the lecture topics and obtain feedback on your comprehension and communication skills.
- A large part of engineering design involves synthesising existing basic engineering components to form new products. To do this well you need to be familiar with some basic engineering science; including materials, manufacturing/workshop processes and testing methods. This is the focus of the **Laboratories.**
- Your work in a **Major Design Project** where you can practise your design skills and demonstrate your understanding of the fundamental concepts of design, teamwork and project management.
- The provision of an electronic **Learning Management System** (LMS). *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: https://moodle.telt.unsw.edu.au.

5 Assessment

Assessment in this course consists of a mixture of individual and team assessments.

The assessments will follow the scheme given in this table:

Current 20 February 2015

Task	Assessment Area	Activity	Weight		LOs	GAs
			Individual	*Team*	Assessed	Assessed
T1	N/A	Project Selection	-	-	-	-
T2	N/A	Team Builder	-	-	-	-
T3	Written Reflection	Impromptu Design	5	-	1b, 2	1a, 1c, 1f, 3b
T4-A	Workplace H&S	Intro to Lab Safety	0	-	4a	1g, 3a, 3c
T4-B		Training at TAFE	5	-	4a	1g, 3a, 3c
T5-A	Written Reflection	CPR 1/3	5	-	1a, 2	1a, 1c, 1f, 3b
T5-B	("Learning Portfolio")	CPR 2/3	5	-	1b, 2	1a, 1c, 1f, 3b
T5-C		CPR 3/3	5	-	1c, 2	1a, 1c, 1f, 3b
T6-A	Technical Steam	Hardware Lab 1/2	10	-	4b	1g, 3a
T6-B		Hardware Lab 2/2	10	-	4b	1g, 3a
T7-A	Design and Planning	Design Proposal	-	10	1a-c, 2, 3, 5	1f-g, 2a, 2c, 3a
T7-B		Presentation	-	5	1a-c, 2, 3	1d, 1f, 2a, 2c
T8	Design and Build	Compliance Testing	-	5	1b-c, 4d	1c, 1d
T9		Project Performance	-	15	1a-c, 2, 4a-b	1d, 2a, 2c
T10		Final Report	-	15	1a-c, 2, 3, 5	1c, 1f-g, 2a, 2c
T11	Journal (with Sketches)	Journal (through sem)	5	-	1a-c	1c-d, 3a
T12	Peer Assessment	Web PA 1/2	-	0	2	1c, 1e, 2c, 4b
		Web PA 2/2	-	(-25)	2	1c, 1e, 2c, 4b
Total			*50*	*50*		

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.

Note that, 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 later in this Outline 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 x 50 marks =) 25 marks from your total course marks for non-participation in team assessment activities.*

5.1 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 well 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 H&S Awareness and Hand Tool Training

T4-A consists of attending a lecture and signing an attendance sheet at UNSW.

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% of your final course mark. So you should complete two of the Labs. 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's proposed design and plan for completion of the Project. The design team should treat the mentor as a client for this task. The team will be assessed on the clarity and professionalism of the presentation as well as the use of verbal and non-verbal cues.

T8 Preliminary Design Performance

This is a laboratory exercise set two weeks before the final run of your prototype. It requires you to demonstrate that the progress of your prototype is on-track to perform the objectives and meet the criteria for the final test. Your prototype must comply with the rules set-out in the Project brief.

T9 Final Design Performance

This is a two-part evaluation of your prototype. The first part will be evaluated on the performance of your prototype in a competition. The second part will be a subjective assessment of your prototype by a panel of judges against set criteria specified in the Project brief.

T10 Final Test Report

This is a final report based upon the results of prototype testing. The report will be in the form of a professional summary reflecting on what was achieved, why it worked out the way it did and how the results could have been better. Discussion should include the materials and construction methods used, issues encountered during the Project and lessons learned.

T11 Journal

A good engineer always keeps a notebook at hand so that any information gathered in the field can be immediately written down or sketched and so not forgotten. You are expected to keep a notebook for the duration of the Project in which you will do all your rough working, sketches etc. Mentors will, on a regular basis **in class time**, assign marks when you present your notebook at mentoring sessions.

T12 Peer Review

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. Details of this process will be made available on *Moodle*.

5.2 Submission and Marking of Assessments

Almost all assessment activities for this course will be administered and submitted electronically through *Moodle* and are due in the week indicated in the following schedule above with additional details provided during lectures and in *Moodle*. Assessment and admission procedures may vary within the technical streams, and it is the responsibility of each student to ensure they know when and where to submit each assessment task.

All written assignments will be assessed on your ability to adhere to the recommended formats for submission and on the quality of your discussion in relation to the content. Whilst it is appreciated that for some of you, English is a second language, this course will require you to submit written work that is of a reasonable standard for a first year engineering student. It is also expected that you make use of available tools to improve your written work, in particular spell-checkers. If you feel that this may be a problem for you, please contact the Learning Centre for additional assistance: www.lc.unsw.edu.au.

Late submissions attract a penalty of 10% per day, unless prior dispensation has been given; i.e. you have previously arranged a delayed deadline with the Project Convenor. It is always worth submitting as, in the event of difficulty making the final grade, late penalties may be removed. *This incremental late penalty does not apply to CPR and WebPA submissions, for which any late assignments receive zero marks*.

The marking scheme for each assessment will generally be available one week before the due-date of the assessment task.

6 Academic Honesty and Plagiarism

Plagiarism is using the words or ideas of others and presenting them 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 booklet which provides essential information for avoiding plagiarism:

https://my.unsw.edu.au/student/academiclife/Plagiarism.pdf

There is a range of resources to support students to avoid 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. Information is available on the dedicated website Plagiarism and Academic Integrity website:

http://www.lc.unsw.edu.au/plagiarism/index.html

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 a 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 presented in a School handout, Administrative Matters for All Courses, available on the School website.

7 Course Schedule

Generally, ENGG1000 has activities on Mondays 2-5 and Thursdays 2-5.

Note that the course, by its nature, has a complex and irregular timetable. You need to be vigilant to ensure you are where you are supposed to be. Not all of the locations and times are known at this time (due to uncertainty in enrolment numbers and composition) and you will be informed of these details in lectures and with posts on *Moodle*. It is your responsibility to find out this necessary information.

Tables M and T that follow show 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. So check Moodle for the latest announcements!*

Table M: Rough schedule for Monday's activities (current 20FEB15).

Week	Date	Time	Monday's Program	Location
	Monday			
01	02-Mar-15	2-3	Course Intro	TBA
		3-4	Course Intro	TBA
		4-5	Course Intro	TBA
02	09-Mar-15	2-3	Debrief - Impromptu Design	TBA
		3-4	Reflective Writing	TBA
		4-5		TBA
03	16-Mar-15	2-3	Lecture D1 - Intro to Engineering Design	Rex Vowels
		3-4	Lecture D2 - Des Phase 1/3 - Prob Def	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
04	23-Mar-15	2-3	Lecture P1/2 - Teams and Minutes & Meetings	Rex Vowels
		3-4	Lecture T2 - Hardware 1 & 2, Matl's & Proc's	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
05	30-Mar-15	2-3	Lecture D4 - Sketching	Rex Vowels
		3-4	Lecture D4 - Sketching	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
"Break"	06-Apr-15		Session Break	
06	13-Apr-15	2-3	Lecture T4 - Hardware 4 & 5, Shafts & Bearings	Rex Vowels
		3-4	Lecture T5 - Hardware 6 & 7, Gears & Springs	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
07	20-Apr-15	2-3	Lecture P3 - Report Writing	Rex Vowels
		3-4	Lecture D5 - Des Phase 3/3 - Eval the Des	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
08	27-Apr-15	2-3	Lecture T6 - Hardware 8, Belts & Chains	Rex Vowels
		3-4	Lecture P4 - Oral Presentations	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
09	04-May-15	2-3	Lecture T7- Engineering Drawing 1	Rex Vowels
		3-4	Project Presentations	TBA
		4-5	Project Presentations	TBA
10	11-May-15	2-3	*Compliance Testing - Low Teams*	TETB LG09
		3-4	*Compliance Testing - Low Teams*	TETB LG09
		4-5	Project Mentoring - Low Teams	Mentoring
11	18-May-15	2-3	Lecture T9 - Hardware 9, Brakes & Clutches	Rex Vowels
		3-4	Lecture T9 - Hardware 9, Brakes & Clutches	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
12	25-May-15	2-3	Lecture P5 - Report Feedback	Rex Vowels
		3-4	(Contingency)	Rex Vowels
		4-5	Project Mentoring - Low Teams	Mentoring
13	01-Jun-15	2-3	*Competition*	TBA
		3-4	*Competition*	TBA
		4-5	*Competition*	TBA

Table T: Rough schedule for Thursday's activities (current 20FEB15).

Date *Thursday*	Thursday's Program	Location	Task Due	
5-Mar-15	Impromptu Design	TBA		
	Impromptu Design	TBA	T1	Project Select
	Impromptu Design	TBA	T2	Team Builder
12-Mar-15	Intro to Project	Rex Vowels	T3	Writing Task
	Introduction to Laboratory Safety	TBA	T4-A	ILS
	(Meet your Group)	Mentoring		
19-Mar-15	Lecture T1 - Hardware 1 & 2, Mat'ls & Proc's	Rex Vowels		
	(Group Work)	-		
	Project Mentoring - High Teams	Mentoring		
26-Mar-15	Lecture T3 - Hardware 3, Fasteners & Ad's	Rex Vowels	T5-A	CPR 1 of 3
	(Group Work)	-		
	Project Mentoring - High Teams	Mentoring		
2-Apr-15	Lecture D3 - Des Phase 2/3 - Concept Des	Rex Vowels		
	(Group Work)	-		
	Project Mentoring - High Teams	Mentoring		
9-May-15	Session Break			
16-Apr-15	*Hardware Lab 1 - Groups 1 and 2*	TETB LG09	T5-B	CPR 2 of 3
	Hardware Lab 1 - Groups 3 and 4	TETB LG09		
	Project Mentoring - High Teams	Mentoring		
23-Apr-15	(Group Work)	-	T6-A	Hardware 1
	(Group Work)	-		
	Project Mentoring - High Teams	Mentoring		
30-Apr-15	*Hardware Lab 2 - Groups 1 and 2*	TETB LG09	T7-A	Des Prop
	Hardware Lab 2 - Groups 3 and 4	TETB LG09	T12-A	WebPA 1/2
	Project Mentoring - High Teams	Mentoring	T5-C	CPR 3 of 3
7-May-15	Lecture T8 - Engineering Drawing 2	Rex Vowels	T6-B	Hardware 2
	Project Presentations	TBA	T7-B	Presentation
	Project Presentations	TBA		
14-May-15	*Compliance Testing - High Teams*	TETB LG09	T8	Compliance
	Compliance Testing - High Teams	TETB LG09		
	Project Mentoring - High Teams	Mentoring		
21-May-15	*Hardware Lab 3 - Groups 1 and 2*	TETB LG09		
	Hardware Lab 3 - Groups 3 and 4	TETB LG09		
	Project Mentoring - High Teams	Mentoring		
28-May-15	(Group Work)	-	T6-C	Hardware 3
	(Group Work)	-		
	Project Mentoring - High Teams	Mentoring	T11	Journal
4-Jun-15	(Group Work - Report Writing)	-	T9	Competition
	(Group Work - Report Writing)	-	T10	Report
	(Group Work - Report Writing)	-	T12-B	WebPA 2/2

Note: TAFE training schedule will be provided separately

8 Expected Resources for Students

8.1 Web-based Resources

8.1.1 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.

8.1.2 Course Web-sites

The main website for this course, *Moodle*, will contain lecture notes, discussion forum, and assignment submission. There are two other websites that will also be used in this course for assessment, for which you will also need accounts: these are *CPR* and *WebPA*. Links to both can be found on the course *Moodle* page.

It is the responsibility of each student to make sure that their logins to these websites are functional and that all assessment tasks are submitted on time. *These websites are not under the individual control of the lecturer and as such do not have the 10% per day late penalty – any late submission will automatically receive a mark of zero.* This is especially true for excuses like “my internet was down” – missed submissions for reasons such as these are merely a result of poor planning on the part of the student. It is your responsibility to make sure the submission is made ahead of time.

8.2 Mentor Meetings

Wisdom is gained most effectively by attempting to avoid the (often painful) mistakes of those who have come before you. Your design team will be assigned a mentor who will be able to provide you with the advice, feedback and encouragement you will need to learn how to perform effectively as an engineering designer. Make full use of these experienced people but do so in a professional manner. Your mentors are busy people like yourselves. Please make specific arrangements with them if contact is required outside of the allocated meeting times for your team.

The *Moodle* site for this course is a vital and integrated part of the learning environment. *Moodle* is the web-based learning management system used by most courses in UNSW Engineering. We recommend that you visit the *Moodle* site daily, but at least twice a week without fail.

8.3 Textbook

Some of your assessment tasks will require access to this text:

Dym, C.L. and Little, P. (2014). *Engineering Design: A Project-Based Introduction*, 4th edition, John Wiley and Sons.

You should have some access to a copy as it provides useful reading on a number of relevant topics. It is available as a published book and as an eBook. There are copies available for purchase from the UNSW Bookshop and from the University Library Reserved Collection. To save money, your Team could buy a shared copy.

8.4 Suggested Reading

Other useful general references include:

8.4.1 Books

Cross, N. (2000). Engineering Design Methods: Strategies for Product Design, 3rd edition, John Wiley and Sons.

Dominick, P.G. et al. (2001). T*ools and Tactics of Design*, John Wiley & Sons.

Dowling, D., Carew, A., and Hadgraft, R. (2010). *Engineering Your Future: An Australasian Guide*, John Wiley & Sons.

Horenstein, M.N. (2010). *Design Concepts for Engineers*, 4th Edition, Prentice Hall.

Samuel, A., *Make and Test Projects in Engineering Design – Creativity, Engagement and Learning,* Springer-Verlag London Limited (2006)

Voland, G. (2004). *Engineering by Design*, 2nd Edition, Pearson/Prentice Hall.

8.4.2 Websites

www.howstuffworks.com

www.matweb.com

www.knovel.com (accessible via UNSW Library *Sirius*)

8.5 Laboratories

A good engineering designer requires a significant amount skill. This is very similar to learning to ride a bike. You can talk about it for as long as you like but sooner or later you need to actually get on the bike and ride it. While falling off is a perfectly acceptable outcome for a novice, there are skills that can be developed before you begin.

In each Lab you will be assessed by your efforts at completing a specified number of activities. These are hands-on activities that are structured to improve your skills in design and aid you in the success of your Major Design Project. Do not copy answers from other students (because they may be wrong!) or ask laboratory staff as soon as you encounter a difficulty. *One of the qualities of a successful engineer is the ability to work things out by*

thinking through the underlying principles first before asking questions. At university, in general, high quality questions will elicit high quality answers.

Safety in Laboratories

For the safety of all in the Laboratories, strict safety precautions must be observed at all times:

- You are not permitted to work unsupervised in the laboratories.
- **Thongs, open-toed sandals or bare feet expose the feet to the risk of injury and are not permitted in laboratories. Footwear must completely cover the feet, including the instep and toes, or you will be required to leave the laboratories.**
- 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.**

8.6 Resource Documents

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

8.7 The UNSW Library

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

www.library.unsw.edu.au

8.8 Hardware Stores

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

9 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 Course and Teaching Evaluation and Improvement (CATEI) 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 improvements are made to the course based, in part, on such feedback.

Recent improvements to the course which have occurred because of student feedback include:

- Simplifying the concept of the major design project.
- Reducing the number of assessment tasks.
- Increasing the amount of demonstrations in lectures.
- Increasing the amount of visual material in the Hardware lectures.

10 Administrative Matters

You are expected to have read and be familiar with "Administrative Matters for All Courses", available on the School website. This document contains important information on student responsibilities and support, including special consideration, assessment, health and safety, and student equity and diversity.

Dr C. Menictas

20 February 2015