UNSW SYDNEY | Australia's Global University

Mechanical and Manufacturing Engineering

Course Outline

Semester 1 2018

ENGG1000

ENGINEERING DESIGN AND INNOVATION

Contents

1. Staff contact details

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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 former 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 cannot be rectified by your mentor, then approach your Project Convenor. However, please note that 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.

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

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 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 of the course outline
	Thursday	2-3pm	
Mentoring	Monday or Thursday	4-5pm	Various Locations
Laboratories	Thursday Weeks 6, 8 and 11.	2-5pm	Willis Annexe (BLDG J18) Lab 116

Summary and Aims of the Course

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 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. Oftentimes, 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.

The aims of the course are to:

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.

Student Learning Outcomes

This course is designed to address thee learning outcomes as follows, in corresponding with the Engineers Australia Stage 1 Competency Standards for Professional Engineers. The full list of Stage 1 Competency Standards can be found in Appendix A.

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

Learning Outcome		**EA Stage 1 Competencies**
1.	Demonstrate an understanding of the process of engineering design and the use of design methods	PE1.5

Learning Outcome		EA Stage 1 Competencies
2.	Understand the dynamics of collaborative teams and how to work effectively within a team to accomplish tasks within given deadlines	PE3.1, PE3.3, PE3.5 PE3.6
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 Will 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, ENGG1000 helps you to sharpen your analytical skills.
- 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.

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.*

UNSW also 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.
https://student.unsw.edu.au/conduct

4. Teaching strategies

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

- The presentation of the material in **Lectures** so that you gain 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** 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. Course schedule

ENGG1000 has activities on Mondays 2pm-5pm and Thursdays 2pm-5pm.

It should be noted 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.

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!

Schedule of Teaching and Learning on Monday

Week	Lecture - Monday 2pm			
	Date	Time	Location	Activity
1	Feb 26	2-3pm	Clancy	Deans Lecture
		3-4pm		3 minute project descriptions by schools
		4-5pm		
2	March 5	2-3pm	Clancy	Review the impromptu design
		3-4pm		Writing exercise
		4-5pm		Mentor Meet and Greet
3	March 12	2-3pm	CLB7	Common Lecture - Problem Definition and Requirements Generation
		3-4pm		
		4-5pm	Various	Project Mentoring
4	March 19	2-3pm	CLB7	Common Lecture - Concept Generation
		3-4pm		
		4-5pm	Various	Mentor Sessions
5	March 26	2-3pm	CLB7	Common Lecture - Concept Evaluation
		3-4pm		
		4-5pm	Various	Mentor Sessions
Break				
6	April 9	2-3pm	CLB7	Common Lecture - Report Writing and Oral Presentation skills (Pam Mort)
		3-4pm		
		4-5pm	Various	Mentor Sessions
7	April 16	2-3pm	CLB7	Common Lecture - Testing, Verification and Validation
		3-4pm		
		4-5pm	Various	Mentor Sessions
8	April 23	2-3pm	Various	Group Assessment - Presentation
		3-4pm		
		4-5pm	Various	Mentor Sessions
9	April 30	2-3pm	Ainsworth Building Lab 116	Group Assessment: Compliance Testing
		3-4pm		
		4-5pm		
10	May 07	2-3pm	CLB7	Technical Lectures: Engineering Drawing
		3-4pm		
		4-5pm	Various	Mentor Sessions
11	May 14	2-3pm	CLB7	Common Lecture - Report Feedbacks
		3-4pm		
		4-5pm	Various	Mentor Sessions
12	May 21	2-3pm	No Class	Group Work: Building
		3-4pm		
		4-5pm	Various	Mentor Sessions
13	May 28	2-3pm	Clancy	Group Assessment: Final Test and Competition
		3-4pm		
		4-5pm		

Schedule of Teaching and Learning on Thursday

Week	Stream - Thursday 2pm			
	Date	Time	Location	Activity
1	March 1	2-3pm	Various	Impromptu Design
		3-4pm		
		4-5pm		
2	March 8	2-3pm	K-F10-M17	Technical Lecture: Project Launch
		3-4pm	No Class	Group Work: Icebreaking
		4-5pm		Mentor Meet and Greet
3	March 15	2-3pm	K-F10-M17	Technical Lecture: Hardware 1&2
		3-4pm	No Class	Group Work: Brainstorming
		4-5pm	Various	Project Mentoring
4	March 22	2-3pm	K-F10-M17	Technical Lecture Hardware 3&4
		3-4pm	No Class	Group Work: Ideating
		4-5pm	Various	Mentor Sessions
5	March 29	2-3pm	K-F10-M17	Technical Lecture: Hardware 5&6
		3-4pm	No Class	Group Work: Writing
		4-5pm	Various	Mentor Sessions
Break				
6	April 12	2-3pm	Ainsworth Building Lab 116	Hardware Lab 1
		3-4pm		
		4-5pm		
7	April 19	2-3pm	Various	Group Assessment - Presentation
		3-4pm		
		4-5pm	Various	Mentor Sessions
8	April 26	2-3pm	Ainsworth Building Lab 116	Hardware Lab 2
		3-4pm		
		4-5pm		
9	May 03	2-3pm	Ainsworth Building Lab 116	Group Assessment: Compliance Testing
		3-4pm		
		4-5pm		
10	May 10	2-3pm	Ainsworth Building Lab 116	Hardware Lab 3
		3-4pm		
		4-5pm		
11	May 17	2-3pm	No class	Group Work: Building
		3-4pm		
		4-5pm	Various	Mentor Sessions
12	May 24	2-3pm	No class	Group Work: Building
		3-4pm		
		4-5pm	Various	Mentor Sessions
13	May 31	2-3pm	No class	Group Work: Report Writing
		3-4pm		
		4-5pm		

Note 1: The TAFE training schedule will be provided separately
Note 2: The coordinator reserves the right to make changes to the schedule as needed

6. Assessment

Assessment Overview

Assessment	Length	Weight	Learning outcomes	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
T1 – Project Selection	N/A	0%	2, 3	Completion of team building activities	Week 1 Moodle submission	Midnight March 9	N/A
T2 – Impromptu Design	N/A	5%	5	Completion and reflection of design task	Week 2 onsite	Midnight March 9	Two weeks after submission
T3A – Design Phase 1	N/A	5%	1	As elaborated by the task specification	Week 4 peer assessment during tutorial	Midnight March 24	Two weeks after submission
T3B – Design Phase 2	N/A	10%	1, 2	As elaborated by the task specification	Week 6 peer assessment during tutorial	Midnight April 15	Two weeks after submission
T4A – Design Proposal	10 Pages	10%	1, 2, 5	Technical writing skill	Week 7 Moodle submission	Midnight April 20	Two weeks after submission
T4B – Design Presentation	N/A	5%	2,3	Design communication and presentation skill	Week 7 & 8 team presentation	Midnight April 27	Two weeks after submission
T5 – Technical Stream	20-25 Quiz	20%	4	Understandings of basic mechanical components	Week 7,9, &11 online quiz	Week 7,9, &11	Two weeks after submission
T6 – Compliance Testing	TBA	5%	2, 3, 4	As elaborated by the task specification	Week 9 onsite inspection	Midnight May 07	Two weeks after submission
T7A – Design Competition	TBA	15%	2, 3, 4	Quality and performance of design prototypes	Week 13 onsite competition	Midnight May 31	Upon release of final results
T7B – Design Report	15 Pages	15%	1, 2, 3, 5	Technical writing skill	Week 13 Moodle submission	Midnight June 3	Upon release of final results
T8 – Team Evaluation	N/A	/	2, 3	Contribution to teamwork	Week 8 &13 Moodle submission	Midnight June 3	Upon release of final results
T9 – Design Journal	20-30 pages	5%	3, 5	Documentation of individual contribution	Ongoing inspection during tutorial	Midnight May 24	Upon release of final results
T10 – TAFE training	N/A	5%	4	As specified by TAFE	Various due dates	Midnight April 26	Week 10

Assignments

Detailed descriptions of the assessment tasks for this course 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 to select in which Project you will work for the duration of Session on Moodle. The Team Builder activity is in the form of a survey to evaluate your knowledge of engineering design and its related activities. Your honest answers will help place you in a well-balanced team for the duration of the Project.

T2 Impromptu Design

“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 have and conclusions you have drawn.

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

T3 Engineering Design Process

- T3-A (5% of course grade): you will be tasked to submit a written statement and make an individual presentation on the problem formulation phase of the design process
- T3-B (10% of course grade): you will be tasked to submit a written statement and make a group presentation on the concept generation phase of the design process.
- Note that for both tasks, you will be tasked to assess your peers’ performance and provide constructive criticism and evaluation

T4 Design and Planning

- T4-A (10% of course grade): you will be tasked to 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 shall be no more than 10 pages.
- T4-B (5% of course grade): you will present your design to your mentors and lecturer. This will be a short 10-15 minute 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.

T5 Technical Stream

A total of 20% of the course grade is drawn from work assessed in the 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*.

It should be noted that some students will be tasked to undertake the technical stream of electrical engineering. These students will need to comply with the assessment requirements of the electrical engineering stream accordingly. More details will be announced later.

T6 Compliance Testing

Prior to the final design competition, every team must demonstrate that the progress of your prototype is on-track to meet the criteria for the final test. Your prototype must comply with the rules set-out in the Project specification, especially the safety standards. This task determines 5% of the course grade.

T7 Design Testing and Report

- T7-A (15% of course grade): 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 specification. Detailed guidance will be provided.
- T7-B (15% of course grade): You will prepare a final report about the testing. The report will be in the form of a professional summary that reflects 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. The total length of the report will be no more than 15 pages.

T8 Team Evaluation

To ensure that all students participate equitably in team assessments there will be a Team evaluation process whereby each student will be evaluated by every member of their team. The results of this Team evaluation will determine your final team mark. Details of this process will be made available on *Moodle*. A total of 55% of the course grade is a result of team effort. The team evaluation component will constitute a maximum of 50% that may be subtracted from your team mark. *That is, you stand to lose up to (55/100 x 50 marks) 27.5% from the course grade for non-participation in team assessment activities.*

T9 Design 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, assign marks when you present your notebook at mentoring sessions. This task determines 5% of the course grade.

T10 TAFE Training

TAFE training will be conducted at Ultimo TAFE, which 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. This task determines 5% of the course grade.

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

Almost all assessment activities for this course will be administered and submitted electronically through *Moodle* and are due in the week indicated in the 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.

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.

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. Attendance

You are required to attend a minimum of 80% of all classes, including lectures, labs and seminars. It is possible to fail the course if your total absences equal to more than 20% of the required attendance. Please see the School intranet and the UNSW attendance page for more information.

8. Expected resources for students

Learning Management System

The 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

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.

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.

Additional Reading

Other useful references include but are not limited to:

- Cross, N. (2000). *Engineering Design Methods: Strategies for Product Design*, 3rd edition, John Wiley and Sons.
- Dominick, P.G. et al. (2001). *Tools 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.

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.

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.

UNSW Library website: https://www.library.unsw.edu.au/
Moodle: https://moodle.telt.unsw.edu.au/login/index.php

9. 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.

In this course, recent improvements resulting from student feedback include simplifying the major design project and increasing the amount of visual material in the Hardware lectures.

10. 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.

11. 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

Dr. Ang Liu

08 February 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