Faculty of Engineering

S2 2015 ENGG1000 Course Outline

Never Stand Still | Faculty of Engineering

FACULTY OF ENGINEERING

ENGG1000

ENGINEERING DESIGN AND INNOVATION

SESSION 2, 2015

Contents

Course staff

This course is jointly coordinated by the Schools of Mechanical and Manufacturing, Electrical Engineering and Telecommunications, Computer Science and Engineering, Chemical Engineering, Photovoltaics and Renewable Energy Engineering and Mining Engineering on behalf of the Faculty of Engineering.

Course Coordinator **Mining Project Co-ordinator**	**Contact Details**
Dr Chris Daly	c.daly@unsw.edu.au School of Mining Engineering, Old Main Building R152 ph 9385 4514
Mechanical Project Co-ordinator **Mechanical Stream Co-ordinator**	**Contact Details**
Dr Chris Menictas	c.menictas@unsw.edu.au School of Mechanical and Manufacturing Engineering, Ainsworth Building J17, Room 402F. ph 9385 6269
Electrical Stream Co-ordinator	**Contact Details**
A/Professor John Fletcher	J.Fletcher@unsw.edu.au School of Electrical Engineering and Telecommunications, Room 131 ph 9385 6007
Computing Project Co-ordinator **Computing Stream Co-ordinator**	**Contact Details**
Mr. Michael Schofield	mschofield@cse.unsw.edu.au School of Computer Science and Engineering, Room K17 106 ph 9385 6604
EWB Project Co-ordinator **Chemical Stream Co-ordinator**	**Contact Details**
Dr Rita Henderson	r.henderson@unsw.edu.au School of Chemical Engineering Phone: 9385-5383
SPREE Project Co-ordinator	**Contact Details**
Mr Michael Richards	michael.richards@unsw.edu.au

Who to Contact

- Your first point of contact is your Mentor. Each design team will be assigned a student Mentor to help guide the team throughout the Course. 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 Course outcome.
- For matters relating to the overall course, please contact Chris Daly c.daly@unsw.edu.au - timetable issues, course logistics etc and special consideration requests, grievances, general issues etc.

- For matters relating to a particular technical stream, please contact the lecturer in charge of that stream.
- Note also the Forums on the subject website, accessed through Moodle (https://moodle.telt.unsw.edu.au). Questions can be posted there and will be answered by the appropriate person at their convenience.

If you do not contact the right person for your query then you run the risk that you will not be answered. It is your responsibility to get it right.

All emails sent should have ENGG1000 in the subject line and address your inquiry in a suitably professional manner. Failure to do so could result in a lengthy delay in response or no response at all.

Consultation Times – Lecturers

There are no fixed lecturer consultation times for this course. Students are requested to formally arrange any meetings with lecturers using the email addresses given above. Most communication with students will be conducted via the web-based Moodle Tool (https://moodle.telt.unsw.edu.au).

Consultation Times – Mentors

Each project group will be assigned a weekly meeting time with a Mentor either Monday 4-5 or Thursday 4-5pm. Consultations with your mentor outside of your scheduled time can be made by mutual arrangement.

Course details

This 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 12 weeks of teaching, study and examination periods equates to approximately 40 hours per week.”

For a standard 24 UoC in the semester, this means 600 hours, spread over an effective 12 weeks of the semester (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 6 h/w of your time.
There is no parallel teaching in this Course.

Course Summary

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 the VF Commodore. 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.

This course looks at what it means to be an engineering designer. You will see the big picture and how all your studies, such as mathematics and science, fit together. It will also look at some of the non-technical issues which are just as vital to a successful engineering career as the technical ones. You will also be given the opportunity to experience engineering in a multi-disciplinary capacity.

You will study and experience Engineering Design as a multi-faceted activity, which requires considerable creativity, as well as judgment, decision making and problem solving skills. You will see the need to complete design projects on time and within specification and budget. The problem solving and project management skills and approach to learning that you develop in this course will be invaluable for later courses in your degree, in your career and for life in general. The specific aims of the course are to:

1. Introduce you to the principles and methods of engineering design.
2. Involve you in a hands-on design and engineering project, with a team of engineers with diverse technical skill sets.
3. Improve your skills in written and verbal expression.
4. Begin to acquire basic skills in a technical engineering field.
5. Introduce you to the manner in which a professional engineer conducts themselves.
6. Provide a team-based environment so you can experience and learn collaborative skills.
7. Help you learn the professional use of information resources.

Detailed Aims of the Course

Through the semester, the specific aims of the course can be summarised as:

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 this Course, 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.

Graduate Attributes

UNSW aspires to develop graduates who are:

Rigorous scholars,
Capable leaders,
Professionals and
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://teaching.unsw.edu.au/graduate-outcomes

The core GAs which we develop in ENGG1000 are:

- Scholars who are able to apply their knowledge and skills to solving problems .
- Leaders who are collaborative team workers .
- 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 .

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.

2. Understand the dynamics of collaborative teams and how to work effectively within a team to accomplish tasks within given deadlines.

3. Understand the basic elements of project management and be able to plan and schedule work activities in accordance with standard practice.

4. Be able to convey your thoughts and ideas effectively in an engineering design report.

5. Become familiar with the tangible elements of mechanical, electrical and computing design:
    a) Demonstrate the safe and effective usage of basic workshop tools or basic electronic test equipment or computer software environment; and
    b) Recognise some basic engineering materials, devices and mechanisms which form the "building blocks" of much of the world's machinery and circuitry.

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, 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.

Expectation 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.*

https://student.unsw.edu.au/attendance

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.

Learning and Teaching Philosophy

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 this Course, 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.

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 this Course will prove invaluable for the remainder of your degree program. The Course consists of lectures, labs and tutorials.

The teaching strategies that will be used in this Course 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 ("Common" lectures) and some basic engineering principles to act as a starting point for addressing the design brief ("Technical Stream" lectures). 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 Course 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.

Course Structure

ENGG1000 for Semester 2, 2015, consists of **three** elements in which you must participate:

1. Teaching in this Course is through staff administration of your chosen **Design and Build Project**.

To help with your successful completion of the Project, there are two Lecture and Assessment streams:

2. The common (compulsory for everyone) **Design and Innovation Stream** is based upon Lectures delivered and assessments administered in class on **Mondays**. All students in ENGG1000 attend these same lectures and participate in these assessments.

3. On **Thursdays**, Lectures and Assessments are delivered for four **Technical Streams**. You may attend and participate in either of the Computing, Electrical, Chemical or Mechanical Lectures and Assessments. Details regarding the assessments in each Technical Stream will be provided later in the course.

Assessment

Assessment in this course consists of a mixture of individual and group assessments. The assessments will follow the scheme given in the following table*.

Activity	Weight	Contribution	Task
Project Selection		----------	T1
Impromptu Design Reflection	5%	Individual	T2
Learning Portfolio	15%	Individual	T3
Design and Planning	15%	Group	T4
Technical	20%	Individual	T5
Compliance Testing	5%	Group	T6
Final Design Testing & Report	35%	Group	T7
Peer Assessment	+/-25%*	Individual	T8
Design Journal	5%	Individual	T9

**** Please note there may be some variation in the weighting assigned to the activities depending on the project selected due to the nature of the final design outcomes. Details will be made available once you have selected your project.***

There are broadly eight assessment tasks in this course, though many of these tasks have sub-components. 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 Course Timetable, and you can see from this that there are assessment tasks due regularly throughout the session.

As can be seen, the total course mark consists of 45% individual and 55% group marks. To ensure that all students participate equitably in group assessments there will be a Peer Review process whereby each student will be evaluated by every member of their group. The results of this Peer Review will determine your final group mark. The Peer Review component will be applied to the T4 and T7 assessments and constitutes a maximum of 50 that *may be subtracted from* your group mark. That is, you stand to lose up to 50 marks from your total course marks for non-participation in group assessment activities.

Course Schedule – see separate document for your project

Note that the course, by its nature, has a complex irregular timetable. Students need to be vigilant to ensure they are where they are supposed to be. Not all of the Generally, ENGG1000 has activities on Mondays 2-5 and Thursdays 2-5. The Monday program will generally consist of a Lecture 2-4 in the Clancy Auditorium which is common material and compulsory for all students enrolled in this course, regardless of project and technical stream.

Mondays 4-5 and Thursday 4-5 have generally been allocated for Mentor meetings – you will be scheduled a location and a timeslot of duration of at least 20 minutes to meet with your mentor. Outside of this meeting, this time is available for you to work on the project as a group – you are advised to use this time wisely.

Thursday 2-4 will generally be for your chosen technical stream. You will be advised of the locations and activities at a later time, once numbers enrolled in each stream are known. Details of the Technical streams will be provided later.

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 course 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 students 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 Pam Mort (P.Mort@unsw.edu.au) at 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. see the lecturer before the due date to avoid penalty. It is always worth submitting as, in the event of difficulty making the final grade, late penalties may be removed.

Summary of Assessment Tasks

A detailed description of the assessment tasks for this course are located on the Moodle "Project Overview and Activities" page.

T1 [Project Selection]

You will be required, on *Moodle*, to select in which Project you will work for the duration of Session. 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 this Course. Your honest answers well help place you in a well-balanced team for the duration of the Project.

T2 [Impromptu Design Reflection]

"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 Course. 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.

T3 [Learning Portfolio]

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 Course.

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-third of the marks for this assessment (that is, 5% of your final grade). I would prefer students to complete this task online via the OU Wiki. This will be discussed in class.

T4 [Design and Planning]

This assessment task assesses your planning and general design solution for the major project. It has three components:

T4A - You will be expected to submit a formal set of minutes of your group meetings along with a Gantt Chart depicting your group's planning and scheduling to achieve the successful delivery of a prototype on the testing day. (5% of final grade)

T4B – 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 between 15 – 20 pages. (5% of final grade)

T4C – You will present your design to your mentor and lecturers. This will be a short 15-20 minute verbal presentation of the group's proposed design and plan for completion of the project. The design team should treat the mentor as a client for this task. The group will be assessed on the clarity and professionalism of the presentation, as well as the use of verbal and non-verbal cues. (5% of final grade)

T5 [Technical]

This depends on which stream you have chosen (Mechanical, Electrical, Chemical or Computing). There are two parts of this technical assessment, each corresponding to 20% of your final grade. Details of these assessments will be provided later by the Lecturer in charge of that stream.

Mechanical Stream Assessment

The Mechanical Stream will feature three hardware related assessment tasks, each worth 10%. The Stream assessment will be based on the best two assessment task scores achieved. For each assessment task, technical lectures and hardware resources will be provided, followed by hardware lab demonstrations and an online quiz.

Hardware Lab 1 – Materials, Processes and Fasteners
Hardware Lab 2 – Shafts, Couplings, Gears and Springs
Hardware Lab 3 – Power Transmission (Drive systems, Clutches Braking systems and applications)

Electrical Stream Assessment

The Electrical Stream will feature three optional assessment tasks, each worth 10%. The first is a Circuit Theory Quiz, in which you'll be asked simple questions on fundamental electrical components, and to perform basic calculations involving Electrical circuits. The second optional assessment task is Practical Lab Exam, in which you'll be required to construct a functional electrical circuit. Finally, the third optional assessment tasks consists of Lab Book Assessment – for this, you are required to regularly have your electrical lab journal marked off regularly by a lab demonstrator at each of the designated check-points.

Students are required to enrol in the Circuit Theory Quiz and the Practical Lab Exam if they wish to undertake these assessment tasks. Further details and the scheduling of these assessment tasks will be provided later in the course, during the Electrical Technical Stream.

Computing Stream Assessment

The Computing Stream will feature three optional assessment tasks, each worth 10%.

1. A Systems Analysis for an automated system similar to one you may be designing for your project. The assessment will focus on the student's ability to design a complex software solution for presentation to their team.
2. A Code Review of the code written for an automated system similar to the one you may be designing for your project. Here the emphasis will be on the structure and layout of the code as well as its functionality.
3. Laboratory Book Assessment showing successful completion of all the laboratory exercises, from Lab 2 to Lab 6 inclusive. This requires you to have all checkpoints marked off by a Laboratory Demonstrator, and submit an electronic lab report containing all code and results.

Chemical Stream Assessment

The Chemical Stream will feature three optional assessment tasks, each worth 10 %.

1. A process engineering quiz, in which students will be asked simple questions on process engineering in relation to water treatment, water quality, sustainability and appropriate technologies.
2. Submission of a report that details for one water quality parameter (from a list provided during class): why it is measured; the ways in which it can be measured; the level of sensitivity and the associated limitations

   Submission of a report that details the basic design features of a water treatment filter and how a design may change depending on whether it is built for a developed vs developing country.

T6 [Compliance Testing]

Prior to taking part in the final design competition testing, the design team must demonstrate that it can meet certain basic functional requirements, as well as meeting the required safety standards.

T7 [Final Design Testing & Report]

This assessment has two parts.

Firstly, you will be assessed on how well your prototype meets the design aims in the practical testing. This will be 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 the criteria specified in the project brief. The detailed breakdown will be project specific.

Then you will prepare a final report on 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, construction methods and issues, lessons learned and a critique on the effectiveness of organisational support.

T8 [Peer Assessment]

To ensure that all students participate equitably in group assessments there will be a **Peer Review** process whereby each student will be evaluated by every member of their group. The results of this Peer Review will determine your final group mark. The moderation of group marks via this process will be based on the results of the final Peer Review.

The Course Convenor reserves the right to moderate the final mark based on overall group performance throughout the course. This is a transparent process and will be discussed in the Monday Classes. Only the final Peer Review will be used as a part of this moderation process.

T9 [Design Journal]

Each student is expected to keep a design journal as a record of their participation and contribution to the project. Mentors will inspect and mark the journal on a regular basis, giving a final grade in the last weeks of the course. Further details will be provided in class.

Academic honesty and plagiarism

The standard UNSW statement on plagiarism is given below.

What is Plagiarism?
Plagiarism is the presentation of the thoughts or work of another as one's own.*Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

https://student.unsw.edu.au/plagiarism
The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students 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 items.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle
† Adapted with kind permission from the University of Melbourne.

Resources for students

The recommended textbook for this course is:

Dym, C.L. and Little, P., *Engineering Design: A project-based introduction*, 4th Edition, John Wiley & Sons (2013)

Suggested additional reading:

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

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

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

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

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

Other useful general references include:
http://www.howstuffworks.com/
www.matweb.com
www.knovel.com (accessible via UNSW Library Sirius)
http://arduino.cc/en/

Course Website

The electronic Learning Management System (LMS) will be your main source of day-to-day information regarding administration of the Course. *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 (z1234567) and your zPass.

All students participating in the Computing Technical Stream will be given access to CSE Lab Computers which will have all of the necessary software to complete their lab work, make their submissions for assessment and complete the computing portion of their project.

Continual course improvement

This is a relatively new course and we are particularly interested in your feedback. We want your suggestions of what is good and should be retained, and what is not so good and should be improved (with ideas on how to do it). In addition to the standard UNSW Course and Teaching Evaluation and Improvement (CATEI) surveys we will be asking for your feedback in other ways during your studies.

Administrative matters

For many of you this will be your first session at UNSW. We are a large, complex organisation and you will have much to become familiar with. Take time to review the documentation on processes and procedures that you will have received at enrolment and from your School. If School documentation is not available, the Moodle site has Administrative Matters documentation for this course.

Occupational Health and Safety

Like the wider community, UNSW has strict policies and expectations on Occupational Health and Safety and you should read these. They may be accessed on:

http://www.ohs.unsw.edu.au

Your School will also have policies that you must get to know and follow. You will be required to undergo a laboratory Occupational Health and Safety training for all university labs you wish to access and use to construct your prototype.

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 – Please read carefully!

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 any of 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 rotating machinery in this Course but please get into the habit of wearing safe clothing in laboratories and workshops.
- You will be required to wear safety goggles when conducting work in the laboratory that could harm the eyes, such as when using an electric sander or when soldering electrical components. The wearing of safety glasses is compulsory at all times in the Chemical Engineering laboratory.
- **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. Please see below for additional requirements.**
- Mining Engineering additionally requires students working in their Laboratory to wear safety boots. A selection of safety boots is available on entry to the lab.
- Students entering the Chemical Engineering labs must wear a laboratory coat, safety glasses and enclosed shoes.
- **The compulsory Lab Induction session – "Introduction to Laboratory Safety" (ILS) will emphasise all these.**

Examination procedures and advice concerning illness or misadventure

There is no formal examination in this course. If you believe that your performance in any assessable component has been significantly affected by illness or other unexpected circumstance, then you should make an application for special consideration as soon as possible after the event by visiting UNSW Student Central. Talk to your course coordinator too. Note that considerations are not granted automatically.

Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or http://www.studentequity.unsw.edu.au/disability-services Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.