



Faculty of Engineering

ENGG1000
ENGINEERING DESIGN
AND INNOVATION

Course Outline

Semester 1 2018

Chris Menictas

Course Co-ordinator

This outline informs you on how this course will be run.

If you need more help...

Ask at the School that you are enrolled in
or ask at the Engineering Student Centre

Once you are enrolled, the Moodle Learning Management site has more
specific information for this course

<http://moodle.telt.unsw.edu.au/>

Quick-start To-Do List

When	Action	Location
Monday Week 1 (Mon 26 th February , 2:00pm)	Attend Introductory lecture	As per your class timetable (see my.unsw.edu.au)
Thursday Week 1, 1 st March: 2pm or 3pm <u>as allocated in first lecture</u> – see Moodle if lost!	Participate in Impromptu Design activity (this activity is assessable)	Various locations and one of two times as allocated in Intro Lecture, and in Moodle or meet outside Engineering Student Centre before 2pm if lost
Monday Week 2 (Mon 5 th Mar, 2:00pm)	Attend lecture on Impromptu Design (includes details of an Assessable task)	As per your class timetable (see my.unsw.edu.au)
Before 11.55PM Tuesday 6 th March (Week 2)	Finalise your decision on the project you want to select; if you make a mistake contact your project coordinator (Page 4)	Via Moodle
Thursday Week 2 and onwards 8 th March 2pm	Attend the project launch lecture for the project you have chosen.	See timetable on Moodle website (check for changes)

Course Staff

The course is coordinated by the Faculty of Engineering and projects will be coordinated by the various schools within the Faculty.

Course Convenor for the Faculty

Dr Chris Menictas
 Location: Ainsworth Building Room 402F
 Phone: 9385 6269
 Email: c.menictas@unsw.edu.au

Contacts for the projects in this course

Project	Coordinator and contact details
Project eEVe	Dr Peter Neal peter.neal@unsw.edu.au Room F10-711A Ph 9385 4814
Robots to the Rescue	Professor Claude Sammut claudio@cse.unsw.edu.au Room K17-401J Ph 9385 6932
Building Structure Against Impact Loading	Dr Di Wu di.wu@unsw.edu.au Ph 9385 8420
Sustainable Water in Cambodia	A/Prof Lucy Marshall lucy.marshall@unsw.edu.au Ph 9385 7944
Wave Energy Balloon Inflator	Prof Ian Turner ian.turner@unsw.edu.au Ph 8071 9829 and Dr Mitchell Harley m.harley@unsw.edu.au Ph 8071 9883
DIY Aerial Photogrammetric Mapping	A/Prof Jinling Wang jinling.wang@unsw.edu.au Ph 9385 4203 A/Prof Linlin Ge l.ge@unsw.edu.au Ph 9385 4177
Bionic Hand	Dr Michael Stevens michael.stevens@unsw.edu.au Room F25-LG10 Ph 9385 3912 and Dr Alex von Brasch a.vonbrasch@unsw.edu.au Room MSEB-719, Ph 9385 4933
Project DELTA on Mars	Dr Ang Liu ang.liu@unsw.edu.au Room J17-408C Ph 9385 64080

Mars Regolith Collection	Dr Bighao Li binghao.li@unsw.edu.au Room K15-148A Ph 9385 0783
Drill ... Baby Drill!	Dr Stuart Walsh stuart.walsh@unsw.edu.au Room TETB-220 Ph 9385 4261
Car of the future – Sun Ray	A/Prof Santosh Shrestha s.shrestha@unsw.edu.au Room TETB - 243 Ph 9385 7267

Course Information

Course Credit Value

This course is 6 units of credit.

Units of credit indicate the nominal workload for students. The normal workload expectations at UNSW are 25-30 hours per session for each unit of credit; including class contact hours, preparation and time spent on all assessable work. For a six unit of credit course with no formal examinations, like ENGG1000, this means a typical average total workload of 11 to 13 hours per week.

Course Organisation

This course is coordinated by the Faculty of Engineering which also arranges some common lectures. Most of the course is run in conjunction with 1 of the 11 projects offered by schools of the Faculty of Engineering and the Faculty of Science (Materials Science and Engineering). Learning activities will vary a little between projects. Although there are differences in presentations, the course is coordinated to ensure equivalence. All the projects are done in groups of usually 5 to 8 students plus a mentor. Group size varies with selected project.

You may select any of the projects, independently of your preferred field of study. It is not mandatory to undertake the project associated with your chosen discipline. This is a common engineering course!

Project Selection

Project selections are to be finalised by 11:55PM on Tuesday 6th March. Descriptions of each of the projects are attached to this outline. You will be given more information to help you finalise your project selection during the first Faculty lecture in Week 1 of the course. Full project descriptions and course outlines are available on Moodle. **Make sure you are certain of which project you wish to enrol in before committing yourself to the online selection option.**

How this Course Fits with Others in your Program

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 study and experience Engineering Design as a multi-faceted activity, which requires considerable creativity, as well as judgement, decision making and problem solving skills. You will see the need to take context into account and be able to complete design projects on time and within budget. The problem solving and project management skills that you learn in this course will be invaluable for later courses in your degree, in your career and for life in general.

Learning and Teaching Philosophy

This course is, first and foremost, an exercise in experiential learning, with emphasis on reflection on the design process. You will work together in teams to design a solution to a specified but open-ended problem. 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 discipline-specific knowledge.

Aims

1. Introduce you to the principles and methods of engineering design.
2. Involve you in hands-on design and engineering projects.
3. Help you gain skills in written expression.
4. Introduce you to the way a professional engineer works.
5. Provide a team-based environment so you can experience and learn collaborative skills.
6. Help you learn the professional use of information resources.

What you are Expected to Learn

After you have completed this course, you will be expected to have the following capabilities.

- Be familiar with the process of engineering design and the use of design methods for defining an open-ended design problem, generating alternative conceptual solutions, evaluating these solutions and implementing them.
- Understand the basic elements of project management and be able to plan and schedule work activities in accordance with standard practice.
- Understand the dynamics of collaborative teams and how to work effectively within a team to accomplish tasks within given deadlines.
- Be able to organise, conduct and record engineering meetings.
- Be able to effectively convey your thoughts and ideas in an engineering design report.
- Be able to understand the issues of quality, safety, diversity and equal opportunity as they apply to university and professional life.
- Understand some of the roles and responsibilities of a professional engineer.

Teaching Strategies

Teaching in this course is centred on the project. For example, you will develop communication skills by communicating about the project; you will develop teamwork and project management skills in the context of your project team; and you will experience the kinds of technical problems resolved by engineers in your selected project area.

How this will work out in detail will depend upon the particular school presenting a particular project. You will receive a separate handout describing this once you have finalised your choice. If you want to see details earlier, refer to the Moodle site for this course.

Learning Outcomes and Assessment Framework

ENGG1000 has been designed to ensure there is equivalence and alignment between the various Project's offered in this course. Each Project operates within an agreed framework of learning outcomes as indicated in the following table.

Learning Outcome	Weight
Development of engineering design skills for creative solutions to open ended problems	30% - 50%
Communication skills in technical report writing, graphical communications and experience in public presentation.	30% - 50%
The development of teamwork and project management skills	10% - 30%
Information gathering and evaluation skills to support the design process.	10% - 30%
School-selected discipline knowledge component	0 - 20%

Full details of each Project's specific assessment activities and their weightings are provided in the project outlines available on the Moodle site. You are encouraged to preview these and download them for future reference.

Because of differences between each Project's specific learning and assessment activities it may be necessary to moderate adjust marks (up or down) to ensure fairness. This will be undertaken after all the results are available at the end of the semester and by a representative panel of the Faculty.

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

General Course Schedule

Shaded items below are Faculty-wide activities

Week	Monday	Thursday
1	Introductions and project descriptions	Impromptu Design (everyone, assessable)
2	Review Impromptu Design including assessable task	Projects commence. Refer to your Project Course Outlines for Timetable
3	Project Activites	Project Activites
4	Project Activites	Project Activites
5	Project Activites	Project Activites
	Semester Break	Semester Break
6	Project Activites	Project Activites
7	Project Activites	Project Activites
8	Project Activites	Project Activites
9	Project Activites	Project Activites
10	Project Activites	Project Activites
11	Project Activites	Project Activites
12	Project Activites	Project Activites
13	Celebrate!	Celebrate!

Times and Rooms

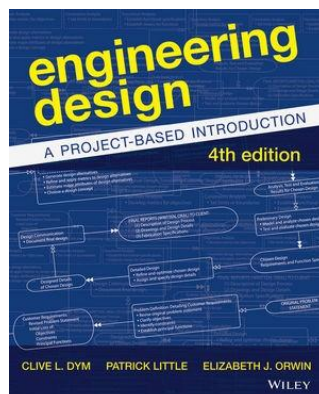
Dates, times and rooms for common Faculty activities are given below. Dates, times and rooms for the project that you select (Thursday, Week 2 onwards) are available via the Moodle site.

NOTE: Clancy Auditorium/CLB 7 (depending on your timetable) is for Monday weeks 1 and 2 only. All other times you will be somewhere else depending on your choice of project. Timetables will be available via Moodle so please check them before the end of week 1.

Resources for Students

The eLearning Moodle site for this course is a vital and integrated part of the learning environment. eLearning is the web-based learning environment at UNSW. You can access eLearning via <http://moodle.telt.unsw.edu.au> and select Login to Moodle using your zPass.

The recommended text for this course is:



Dym, Clive L., Engineering Design A Project Based Introduction.
It is available as a text and as an accompanying eBook from the Bookshop.

You should have access to a copy as it provides useful reading on a number of relevant topics. There are copies available for purchase from the University Book Store and available in the University Library Reserved Collection. The coordinator of your selected project will tell you if alternative or additional textbooks are recommended. References specific to a particular project are given in the School outlines that will be supplied after you have finalised your decision and may be previewed on the eLearning site for this course.

Continual Course Improvement

Engineering Design is a team effort 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 (myExperience) surveys we will be asking for your feedback in other ways during your studies. Do make attempts to communicate constructive feedback to your lecturers. Feedback on particular tasks are often requested during the course.

Administrative Matters

For most 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. Additional Administrative Matters documentation for this course will be posted on the Moodle site.

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 has rules for computer use, for example, for email 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.

Procedures for Submission of Assignments

Instructions will be supplied by the School concerned during lectures and within the respective course outlines.

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.gs.unsw.edu.au/policy/ohspolicy.html>

Your School will also have policies that you should get to know and follow.

Examination Procedures and Advice Concerning Illness or Misadventure

There are no formal examinations in this course. However, if you find that your performance in an 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 convenor 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 www.studentequity.unsw.edu.au/). 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.

My eLearning Enrolment Information for ENGG1000

Once you have read this booklet and decided upon a project that is of interest to you, you can then visit Moodle's ENGG1000 course module to commence the project selection process.

The next step is to go into the **Project Description Document on Moodle** and research the various projects that are available. When there is no doubt in your mind which project you want to do, click on the signup tool icon. You may select any of the projects, independently of your preferred field of study. It is not mandatory to do the project associated with your chosen discipline. **If you make a mistake please contact the Faculty Course Coordinator via the email address given at the beginning of this outline.**

Introduction to the Projects

Why Projects?

We want you to experience the engineering design process as well as hear about it and reflect upon it. So, in this course you will learn by doing; by working on tasks connected with a project.

Performance of your design will be one important part of the assessment, the other marks will be awarded for process (what you do) and your reflection (thinking about and showing that you have understood what you do).

Range of Projects and Project Selection

Projects fall within the topic areas listed below. Some areas have more than one project. You may choose a topic in any area, irrespective of the program you are enrolled in. **All selections are subject to quotas. Selections may be changed on-line up to Tuesday of week 2. For exceptional circumstances please contact the relevant School coordinator.**

Topic area	Project title(s)
Chemical Engineering	Project eEVe
Computer Science and Engineering	Robots to the Rescue
Civil and Environmental Engineering	Building Structure Against Impact Loading Sustainable Water in Cambodia Wave Energy Balloon Inflator DIY Aerial Photogrammetric Mapping
Graduate School of Biomedical Engineering and Electrical Engineering	Bionic Hand
Mechanical and Manufacturing Engineering	Project DELTA on Mars
Mining Engineering	Mars Regolith Collection
Petroleum Engineering	Drill ... Baby Drill!
Photovoltaic and Renewable Energy Engineering	Car of the future – Sun Ray

*Chris Menictas
February 2018*