CVEN3031 Civil Engineering Practice
CVEN3731 Environmental Engineering Practice

Semester 2, 2016

Never Stand Still | Faculty of Engineering | School of Civil and Environmental Engineering

COURSE DETAILS

Units of Credit	6	
Contact hours	4 hours per week	
Class	Friday, weeks 1-8 and 10-12. 13:00 – 15:00	CLB 7
Workshop (and exhibition session* in week 8) *The exhibition session will take place in room 501 of the civil building. You will be advised of an allocated time slot.	Friday, weeks 1-8 and 10-12. 15:00 – 17:00	Groups will be formed and rooms will be allocated in week 1. Quad G025 Gold G05 Quad 1046 AinswthG01 Ainswth101 Quad G046 Quad 1047 Quad G052 G27 LG06 Quad 1045 Gold G03 Quad G047 Mat 231 Ainswth201 RedC 3037
Course Coordinator and Lecturer	A/Prof Adrian Russell - CVEN	
Other lecturers	Dr Vinayak Dixit - CVEN Ms Melinda Hodges – Creativity expert Guests from industry and UNSW's Faculty of Arts	

INFORMATION ABOUT THE COURSE

This course is about the doing of engineering design. It will help students develop their *engineersmanship*. The course will make students appreciate there is more to design than analysis and following codes, and that it is a creative and innovative process.

Many parts of the civil and environmental engineering curriculums involve students learning mechanistic and law-like solutions to problems, guided by text books and design standards. This type of problem solving is important. But it is just as important for students to be creative and innovative in their problem solving. Rapid urbanisation around the world means problems are becoming more complex and unexpected requiring solutions for which text books and design standards are of limited use.

DESCRIPTION

This course will facilitate students being more innovative and creative in their problem solving. Businesses in engineering are under pressure to be innovative. However, the civil and environmental engineering sectors are conservative and heavily influenced by codes, standards and what is traditionally seen as best-practice. Some businesses in those sectors recognise this approach stifles innovation so are developing in-house innovation capabilities and changes to their problem solving practices.

Case-study-based and project-based learning will be used in the course over a traditional engineering teaching structure where the innovative actions of a student might be under-developed, pass unnoticed or be suppressed.

Examples of innovation will be presented by industry and creativity experts.

OBJECTIVES

The overarching objectives of the course are to:

- develop students' capabilities to challenge the status quo and lead innovation;
- develop students capabilities to be independent and collaborative enquirers, and to be able to innovate by applying their knowledge and skills to the solution of novel problems;
- help students become entrepreneurial leaders capable of initiating and embracing innovation, as well as engaging and enabling others.

Other objectives include:

- provide student's with experiences typical of what a graduate engineers may encounter;
- allow students to utilise capacity for analytical and critical thinking and problem solving skills;
- provide students with the freedom to engage in independent and reflective learning;
- enhance students' researching/data gathering skills;
- provide students with opportunities for collaborative group work;
- provide an environment in which students can develop their project management skills;
- give students a respect for ethical practice and social responsibility; and
- enhance students' communication skills.

TEACHING STRATEGIES

The course will require students to engage with content through a number of formats.

Lectures: Formal lectures will be presented to provide key information for projects and examples. Students are expected to attend all the lectures.

Workshops: The workshops will be where students meet to plan group work and present to the demonstrator their progress. Students are required to be present and participate in all workshops. The demonstrators should not be considered as experts on the individual projects. They are merely there to monitor progress and provide general guidance and encouragement.

Assignments and private study: Much of the group work will require self-research and study. The private study should include review and reflection of lecture material; design and analysis; and research via internet, library and other sources.

For each hour of contact it is expected that you will put in at least 1.5 hours of private study.

Examples of the approaches to learning are:

Private Study	• Review lecture material and other material sourced by the students • Do set tasks and assignments • Join Open Learning discussions of problems • Reflect on class problems and assignments • Download materials from Open Learning • Keep up with notices via Open Learning
Lectures	• Find out what you must learn • Be exposed to methods, techniques and ideas • Learn from examples

	• Hear announcements on course changes
Workshops	• Be guided by Demonstrators • Solve set problems • Ask questions
Assessments (assignments)	• Demonstrate knowledge and skills • Demonstrate higher understanding and problem solving

EXPECTED LEARNING OUTCOMES

The course designers are mindful that typical 3rd year engineering students typically have the following capacities and experiences which are relevant to engineering design:

a) A good knowledge of the basic engineering sciences and the ability to relate this to specific designs and problems
b) A good mathematical knowledge, and experience in applying mathematics of considerable sophistication to analytical problems (such as structural analysis, systems analysis etc.)
c) Limited competence in drawing and drafting
d) Little knowledge of the structure of businesses and industries and of construction processes
e) Broad knowledge of the properties of common engineering materials (water, sand, clay, rock, concrete, steel) but little knowledge of properties of advanced materials
f) Little knowledge of cost of standard materials, components, construction processes and limited experience in working to a cost ceiling or tight time schedule for absolute finality of a task
g) Will probably be aware of some of the social consequences that may arise due to an engineering design but will be uncertain how to handle the problems that arise.

This course will help students become better designers by developing capacities and experiences in these areas, especially (c), (d), (f) and (g).

By the end of this course students will be able to:

- Collaborate to research, plan and design an original solution/s for engineering problems:
  - Be innovative and creative in the approach to design
  - designing for the real-world
  - consider sustainable and hybrid approaches to design

- Engage in a range of assessment practices and critical conversations about design through:
  - interaction, visual and written idea generation, through an open learning page
  - self assessment and peer assessment
  - interaction and discussions with lecturers, demonstrators, guest presenters and peers

ASSESSMENT

The assessment will be based on three mini projects (each worth 15%), one major project (worth 45%) and workshop participation and journal entries (worth 10%).

For each mini project self- and peer-assessment will be used, along with independent assessment by a demonstrator. Mini projects 1 and 2 will be assessed as follows:

Group's self-assessment of each group member	Demonstrator's independent assessment of each group member	Demonstrator's independent assessment of entire group	Peer-assessed mark 1	Peer-assessed mark 2	Total
(/10)	(/10)	(/10)	(/35)	(/35)	(/100)
{As a group you are to give each group member a score on their performance and contribution}	{Based on how well each member completed tasks and contributed to the group}	{Based on how well the group functioned and collaborated}	Two other groups will assess your work (double blind)		

Mini project 3 will be assessed as follows:

Group's self-assessment of each group member	Demonstrator's independent assessment of each group member	Demonstrator's independent assessment of entire group	Demonstrator-assessed mark 1 (report, drawings and model)	Peer-assessed mark 2 (only the model)	Total
(/10)	(/10)	(/10)	(/35)	(/35)	(/100)
{As a group you are to give each group member a score on their performance and contribution}	{Based on how well each member completed tasks and contributed to the group}	{Based on how well the group functioned and collaborated}	{Assessed during the model exhibition sessions}		

For the major project self- and expert-assessment will be used, along with independent assessment by demonstrators, as follows:

Group's self-assessment of each group member	Demonstrator's independent assessment of each group member	Demonstrator's independent assessment of entire group	Expert-assessed mark	Total
(/10)	(/10)	(/10)	(/120)	(/150)
{As a group you are to give each group member a score on their performance and contribution}	{Based on how well each member completed tasks and contributed to the group}	{Based on how well the group functioned and collaborated}	Two other groups will assess your work (double blind)	

For workshop participation and journal entries, in the workshops for the ten weeks 2-8, 10-12, a mark of 1 or 0 will be allocated to each student by a demonstrator, indicating satisfactory or unsatisfactory.

PROJECTS

1.	Mini project 1:	issued on: 05/08 (wk 2)	due on: 3pm 19/08 (wk 4)
2.	Mini project 2:	issued on: 19/08 (wk 4)	due on: 3pm 02/09 (wk 6)
3.	Mini project 3:	issued on: 02/09 (wk 6)	due on: 3pm 16/09 (wk 8)
4.	Major project:	issued on: 16/09 (wk 8)	due on: 3pm 28/10 (wk 13)

Late work will be penalised at the rate of 10% per day after the due time and date have expired.

PRIZES

For the mini projects the four groups with the highest assessment scores will be determined. Those four groups will be required to deliver a presentation of their designs to the entire class in a lecture after the mini project due dates. A $500 prize will be awarded to the best design of the four, as judged by the class immediately after the presentations are given.

Results in this course will contribute to the Civil Engineering Practice Prize and the Environmental Engineering Practice Prize, awarded to individual students, presented at the fourth year dinner. In previous years the prizes were worth $1000 each and were sponsored by Cardno.

COURSE PROGRAM

Week	Date	Topic	Assessments
1	29/7	Introduction: Engineermanship and the design process, innovation and creativity in engineering. Hand drawing.	
2	5/8	Guest Lecture- Laing O'Rourke - Sunshift solar power. Mini project 1 introduced.	
3	12/8	Guest Lecture - Advisian - water projects. Guest Lecture - Kerry Thomas 'The Creative Object'.	
4	19/8	Hybrid design, functional facades. Mini project 2 introduced.	Mini project 1 due **(15%)**
5	26/8	Guest Lecture - Advisian - Costs and constructability. Student presentations of mini project 1.	
6	2/9	Earthquake shaking table and foundation designs. Mini project 3 introduced.	Mini project 2 due **(15%)**
7	9/9	Guest Lecture- Laing O'Rouke - Digital communication strategies. Student presentations of mini project 2.	
8	16/9	Major project introductions/context: 1. Self-sustaining life/mining the moon. 2. Drought proofing Sydney and rural NSW. 3. Disaster proofing Sydney (earthquakes/tsunamis). 4. Autonomous vehicle transport system for Sydney. Student model exhibition of mini project 3.	Mini project 3 due **(15%)**
9	23/9	Non-teaching week (CEVSOC Camp for 3rd year students)	
10	7/10	Guest Lecture - Kerry Thomas 'The Creative Performance'. Student presentations of mini project 3.	
11	14/10	Guest Lecture - Deloitte Australia - transport. Guest Lecture - GoGet – transport.	
12	21/10	Public art interventions, disaster proofing cities. Art of Recovery film Christchurch. (To be confirmed)	Participation/journal entry mark collated **(10%)**
13	28/10	No lecture or workshop. Major project submission.	Major project due **(45%)**

RELEVANT RESOURCES

- Most course materials and communications outside of lectures/workshops will be provided through openlearning.
  https://www.openlearning.com/courses/cven3031-3731-civil-environmental-engineering-practice/HomePage

- Lecture recordings will be available through Moodle.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

https://my.unsw.edu.au/student/resources/KeyDates.html

PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found

them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

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

ACADEMIC ADVICE

(Formerly known as Common School Information)

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations,
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC.

Refer to Academic Advice on the School website available at:

https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice