



SEMESTER 1, 2013

**CVEN9892 SUSTAINABILITY ASSESSMENT AND RISK
ANALYSIS IN WATER AND ENERGY SYSTEMS
PLANNING**

COURSE DETAILS

Units of Credit	6
Contact hours	3 hours per week
Class & Tutorial	Thursday, 15:00-18:00, Civil Engineering 101 (K-H20-101) You should assume you need an electronic calculator during every tutorial
Course Coordinator and Lecturer	Dr Stuart Khan Email: s.khan@unsw.edu.au Office: Room 311, School of Civil & Environmental Engineering (Bld H20) Phone: 02 9385 5070
Tutor	None assigned.

INFORMATION ABOUT THE COURSE

This course will introduce students to a series of practical tools for sustainability assessment and risk assessment. Although many of the tools are widely applicable, the focus and practical examples are most generally related to the water industry. There are no specific prerequisites for this course but it assumes some familiarity with water supply technologies, will involve computational activities and is aimed at students with an undergraduate degree in engineering.

HANDBOOK DESCRIPTION

The design of water and energy systems has advanced from a cost-benefit basis to the incorporation of quantitative assessments of environmental burdens and the human and environmental risks associated with competing options.

This course will equip students with the ability to apply life cycle assessment (LCA) and life cycle costing (LCC) for quantifying environmental and economic performance, and an understanding of the factors that define human health and environmental risks. The latter include the presence of chemicals and pathogenic organisms, and the reliability of engineered systems.

<http://www.handbook.unsw.edu.au/postgraduate/courses/2013/CVEN9892.html>

OBJECTIVES

The aim of this course is to introduce sustainability assessment tools – in particular LCA, LCC and risk assessment (RA) - to put them into the context of strategic planning processes with regards to water and energy services and to enable students to make more informed decisions towards increased sustainable outcomes.

In addition, the course aims to foster:

- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning
- Skills for collaborative and multi-disciplinary work
- A respect for ethical practice and social responsibility.

TEACHING STRATEGIES

- Private Study**
 - Review lecture material and additional reading
 - Complete all assignments
 - Download materials from UNSW Blackboard
 - Keep up with notices and find out marks via UNSW Blackboard
- Lectures**
 - Find out what you must learn
 - Summarise essential course material from lectures and associated reading
 - Hear announcements on course changes
- Tutorials**
 - Be guided by discussion questions and additional reading
 - Participate and attempt all tutorial questions
 - Ask questions
- Assessments**
 - Enhance your knowledge by undertaking necessary research to complete these tasks
 - Demonstrate your knowledge and skills
 - Demonstrate higher understanding and problem solving
 - Do not copy sections from textbooks or websites, always use appropriate references for sourced material

EXPECTED LEARNING OUTCOMES

At the end of this course, students will be able to conduct simple LCAs using professional software. They will be able to describe and contrast different quantitative option evaluation methods including LCC and RA. They will also be able to plan a decision making process, interpret the outcomes from each assessment method, evaluate them by using multicriteria analysis (MCA) and make recommendations towards more sustainable decision making processes. Students will be understand the basic principles of water quality risk assessment be able to undertake risk assessment calculations and formulate reasonable conclusions based on risk assessment activities.

ASSESSMENT

The final examination will constitute 50% of the overall course mark. The remaining 50% is comprised from the two assignments as shown in detail below.

Students must to actively project manage their assignment work in order to gain a good mark in the major assignment. Students should expect to spend a significant amount of time working with their team to develop their major project. The major assignment and the exam will test the students' ability to synthesise the overall course. All material presented during the session, including by guest lecturers, will be examinable in the exam unless otherwise noted.

The formal exam scripts will not be returned. Students who struggle with the material set in tutorials are recommended to discuss progress with the lecturer during the session. The Course Coordinator reserves the right to adjust the final scores by scaling if agreed with the Head of School. Details of each assessment component, the marks assigned to it, and the dates of submission are set out below.

ASSIGNMENTS

Assessment details	Issue in	Marks	Due Date
1. Life Cycle Assessment (Group work)	Week 4	25%	Friday 19 th April
2. Environmental Chemical Risk Assessment (Group work)	Week 9	25%	Friday 31 st May
3 Final Exam	Exam week	50%	N/A.

All assignments and reports are to be submitted electronically via UNSW Blackboard. No hard copies will be accepted. No emailed copies will be accepted. Assignments and reports are due before midnight on the due date. Late assignments will receive a 10% penalty per week or part thereof.

Marking criteria:

All assignments will be marked on the basis of whether the student demonstrates an understanding of the material. Where numerical errors can be identified as simple slips, penalties will not be as large as when errors appear to be a result of a conceptual misunderstanding, or the source of the error is difficult to determine from the working. The major assignment will be additionally assessed with respect to the depth of the analysis, the breadth of its consideration of the question at hand and the clarity of the way in which the answer is presented. The use of tables and diagrams is encouraged. **Please make sure you do not exceed the imposed word limits.**

COURSE PROGRAM**SESSION 1 2013:**

Week	Date	Lecture Topic	Tutorial	Lecturer
1	7 Mar	Sustainable water management	Sustainable water management	Stuart Khan
2	14 Mar	Sustainable energy management & GHG emissions	GHG emissions accounting	Stuart Khan
3	21 Mar	Material flow analysis and introduction to life cycle assessment	LCI and allocation	Stuart Khan
4	28 Mar	Life cycle assessment	*GaBi computer Lab	Stuart Khan
MID SEMESTER BREAK				
5	11 Apr	Input-output analysis in LCA	Input-output analysis in LCA	Stuart Khan
6	18 Apr	Costing and pricing of resources	Costing and pricing	Stuart Khan
7	25 Apr	ANZAC DAY PUBLIC HOLIDAY – NO CLASS		
8	2 May	Risk analysis: Concepts and Frameworks	Risk analysis	Stuart Khan
9	9 May	Environmental chemical risk assessment	Environmental chemical risk assessment	Stuart Khan
10	16 May	Environmental microbial risk assessment	Environmental microbial risk assessment	Stuart Khan
11	23 May	Disability Adjusted Life Years (DALYs)	Disability Adjusted Life Years (DALYs)	Stuart Khan
12	30 May	Risk management in engineered systems	Risk Management	Stuart Khan
13	6 Jun	Multicriteria assessment	Multicriteria assessment	Stuart Khan

*Location: Computing laboratories, School of Civil & Environmental Engineering.

RELEVANT RESOURCES

There are no specific textbooks recommended for this course.

However, the students will be introduced to a large range of standards and guideline documents throughout the lecture series. Relevant documentation will be provided on UNSW Blackboard with each lecture.

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:

<http://www.lc.unsw.edu.au/onlib/plag.html>

ACADEMIC ADVICE

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 Common School Information on the School website available at:

<http://www.civeng.unsw.edu.au/info-about/our-school/policies-procedures-guidelines/academic-advice>

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