UNSW Course Outline

CVEN4104 Sustainability in Construction - 2024

Published on the 15 May 2024

General Course Information

Course Code : CVEN4104
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Civil and Environmental Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate, Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course will provide fundamental knowledge and hands-on experience for practising sustainability in construction. The aim is teaching the environmental, social and economic impacts of buildings and built environment and demonstrating how sustainable construction

design can avoid global warming and resource depletion issues. The contents of this course are designed to provide hands-on experience in analytical thinking and decision making with regards to the application of sustainability in construction projects. This course explains history and drivers of sustainability in construction and review sustainability policies, programs, and incentives in Australia. Principles of life cycle assessment (LCA) and life cycle costs (LCC) will be explained, and hands-on experience of evaluating LCA and LCC will be offered in the workshop classes and group assignment. This course also provides an overview of the current green rating systems for buildings and built environment in Australia. Additionally, examples of sustainable construction design, materials and energy resources, as well as case studies of best sustainable practices and future trends of sustainable construction will be demonstrated. A number of alternative strategies available in design, procurement, construction, operation and end-of-life phases to reduce the overall environmental impact of a construction project are discussed. Students are expected to learn how the available strategies, standards and guidelines can be applied to analyse and improve sustainability in practice.

Course Aims

The aim of this course is to introduce students to sustainability in construction

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Summarise the history and drivers of sustainability in construction, as well as sustainability policies, programs, and incentives in Australia
CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity
CLO3 : Explain how green rating schemes work in Australia
CLO4 : Distinguish sustainable construction design, materials and energy resources used in case studies of best sustainable practices and future trends in sustainable construction

Course Learning Outcomes	Assessment Item
CLO1 : Summarise the history and drivers of sustainability in construction, as well as sustainability policies, programs, and incentives in Australia	• Quiz 1 • Quiz 2 • Final Exam
CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity	• Group Assignment • Quiz 1 • Quiz 2 • Final Exam
CLO3 : Explain how green rating schemes work in Australia	• Quiz 2 • Final Exam
CLO4 : Distinguish sustainable construction design, materials and energy resources used in case studies of best sustainable practices and future trends in sustainable construction	• Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Additional Course Information

Prerequisites

Not applicable.

Assumed Knowledge

No background knowledge is required.

Platforms and Communication

This course will use Moodle as the method of communication. The primary communication channel will be the Moodle Q&A forum.

Class Times

Please refer to your class timetable for the learning activities you are enrolled in and attend only those classes.

* Note: If you are unwell or have been asked to self-isolate - please do not attend campus or class and join online class for that week.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quiz 1 Assessment Format: Individual	10%	Start Date: 17/06/2024 12:00 PM Due Date: 17/06/2024 12:15 PM
Quiz 2 Assessment Format: Individual	10%	Start Date: 29/07/2024 12:00 PM Due Date: 29/07/2024 12:15 PM
Group Assignment Assessment Format: Group	30%	Start Date: 16/06/2024 12:00 AM Due Date: 22/07/2024 10:00 AM
Final Exam Assessment Format: Individual	50%	Start Date: TBA Due Date: TBA

Assessment Details

Quiz 1

Assessment Overview

Quiz with multiple choice and true/false questions.

Course Learning Outcomes

- CLO1 : Summarise the history and drivers of sustainability in construction, as well as sustainability policies, programs, and incentives in Australia
- CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity

Detailed Assessment Description

The lecture contents of Week 1-3 will be assessed.

Submission notes

The quiz will be through Moodle during the lecture (in-person attendance is required)

Assignment submission Turnitin type

Not Applicable

Quiz 2

Assessment Overview

Quiz with multiple choice and true/false questions.

Course Learning Outcomes

- CLO1 : Summarise the history and drivers of sustainability in construction, as well as sustainability policies, programs, and incentives in Australia
- CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity
- CLO3 : Explain how green rating schemes work in Australia

Detailed Assessment Description

The lecture contents of Week 4-9 will be assessed.

Submission notes

The quiz will be through Moodle during the lecture (in-person attendance is required)

Group Assignment

Assessment Overview

A short report for each student group and 5-10 mins group presentation 30% (2/3 for report and 1/3 for presentation)

Course Learning Outcomes

- CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity

Detailed Assessment Description

You need to come up with a sustainable alternative/solution in one of their construction activities by conducting a lifecycle analysis (LCA). The sustainable alternative/solution MUST be compared with the currently used reference product/process in two separate lifecycle analyses.

You need to create a group of three students and choose one student as the lead for communication purposes with the course conveyor. The lead student needs to organise the briefing meeting with other group members and s/he will be the contact person for communication with the course conveyor and responsible for submitting the report. You can choose your topic as a group but first research if you have enough relevant data. You must be

part of a group of three students and have a confirmed topic by the end of Week 4 otherwise please contact the course conveyor immediately.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Final Exam

Assessment Overview

The exam will take place during the formal exam period. It may contain multiple choice, true/ false, short answer and calculation questions.

Course Learning Outcomes

- CLO1 : Summarise the history and drivers of sustainability in construction, as well as sustainability policies, programs, and incentives in Australia
- CLO2 : Demonstrate hands-on skills in evaluating life cycle assessment and life cycle cost assessment in a construction-related activity
- CLO3 : Explain how green rating schemes work in Australia
- CLO4 : Distinguish sustainable construction design, materials and energy resources used in case studies of best sustainable practices and future trends in sustainable construction

Detailed Assessment Description

All the lecture and workshop contents will be assesed.

Assessment Length

2 hours exam

Assignment submission Turnitin type

Not Applicable

Hurdle rules

A mark of at least 40% in the final examination is required before the class work is included in the final mark.

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	▯ Construction industry and its environmental impacts ▯ Definition of sustainability in construction and its pillars ▯ Sources of energy consumptions in building construction ▯ Demand versus supply and its impacts on sustainability ▯ A brief history of sustainability in construction
Week 2 : 3 June - 9 June	Lecture	▯ Sustainability stakeholders, risks & rewards and implement-ability of sustainability policies ▯ General knowledge of sustainability policies, programs and incentives in Australia ▯ Sustainability in construction from the corporate perspective and engineering challenges ▯ Decision-making based on sustainability pillars, goals and objectives
Week 3 : 10 June - 16 June	Lecture	LCA goal and scope definition and life cycle inventory analysis
	Workshop	▯ Case studies of sustainable projects (three pillars, risks and rewards) ▯ Sustainability objectives in construction (three pillars, SMART) ▯ Assessment questions from last year
Week 4 : 17 June - 23 June	Lecture	▯ Life cycle inventory diagram
	Workshop	▯ Recap on LCA Goal and Scope definition ▯ Practising the use of decision context mapping in Goal Definition ▯ Practising on drawing a simple LCA diagram ▯ Assessment questions from last year
Week 5 : 24 June - 30 June	Lecture	Life cycle impact assessment
	Workshop	▯ A quick recap of Unit Process, Flows, Boundaries, and Process Levels ▯ Practising on drawing a more detailed LCI according to ISO14040/14044 ▯ Assessment questions from last year
Week 7 : 8 July - 14 July	Lecture	▯ An Introduction to life cycle costing (LCC) for decision-making ▯ Description of several approaches and terms, fundamental principles and different types of costs
	Workshop	▯ Evaluation practice of LCC ▯ Assessment questions from last year
Week 8 : 15 July - 21 July	Lecture	Introduction of sustainable alternative options of construction design, materials and energy resources for buildings and built environment (Part 1)
Week 9 : 22 July - 28 July	Lecture	Introduction of sustainable alternative options of construction design, materials and energy resources for buildings and built environment (Part 2)
Week 10 : 29 July - 4 August	Lecture	Major voluntarily and mandatory green rating systems in Australia: ▯ Green star ▯ NABERS ▯ NatHERS ▯ BASIX

Attendance Requirements

Students are strongly encouraged to attend all lectures or review lecture recordings.

Attendance is required for lectures in Week 4 and Week 10 (for quizes) and workshops (Week 3-5, 7). If your absence equates to more than 20% workshops, you may fail the course, or be denied special consideration (school's policy).

General Schedule Information

Lecture Mon 10:00 - 13:00 (Weeks:1-2,4-5,7-10)

Workshop Tue 11:00 - 13:00 (Weeks:3-5,7) OR

Workshop Tue 13:00 - 15:00 (Weeks:3-5,7) OR

Workshop Wed 11:00 - 13:00 (Weeks:3-5,7) OR

Workshop Wed 13:00 - 15:00 (Weeks:3-5,7)

Course Resources

Recommended Resources

- Book: Life Cycle Assessment: Theory and Practice (2018) by Hauschild, Michael, Rosenbaum, Ralph K., Olsen, Stig. (ebook is available in UNSW library)
- Book: Sustainable Buildings and Infrastructure: Paths to the Future by Annie R. Pearce , Yong Han Ahn, and HanmiGlobal Co Ltd (ebook is available in UNSW library)
- Recommended websites in the lecture contents.

Course Evaluation and Development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussions with students inside and outside of class, 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.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Dr Ali Kashani					No	Yes

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. 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 Equitable Learning 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.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagarism

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, visit: 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.

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 or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School-specific Information

Final Examinations

Final Exams in T2 2024 will be held on campus between the 9th - 22nd August, and Supplementary Exams between the 2nd - 6th September 2024. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

School Contact Information

For assistance with enrolment, class registration, progression checks and other administrative matters, please see the Nucleus: Student Hub. They are located inside the Library – first right as

you enter the main library entrance. You can also contact them via http://unsw.to/webforms or reserve a place in the face-to-face queue using the UniVerse app.

For course administration matters, please contact the Course Coordinator.

Questions about the this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.