



## UNSW Course Outline

# CVEN4705 Environmental Sustainability - Methods, Tools, Management - 2024

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## General Course Information

**Course Code :** CVEN4705

**Year :** 2024

**Term :** Term 3

**Teaching Period :** T3

**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

An introduction to sustainable engineering principles and the social, economic and political

context in which they have arisen, and in which they are implemented. It introduces methods, techniques and tools used by public and private sector sustainability managers to implement sustainable engineering principles in organisations, regions, projects and processes. Sustainability assessment techniques are introduced that can be applied at a product level (Life Cycle Assessment), at a corporate and regional level (Materials Flow Analysis) and at a regional and national level (Environmental Footprint and Input-Output Analysis). The course will introduce principles of Industrial Ecology (IE) and the preparation of Environmental Impact Statements (EIS), Environmental Management Systems (EMS) and Environmental Reports (ER).

## Course Aims

To introduce students to principles of Ecologically Sustainable Development (ESD), Sustainable Engineering and Industrial Ecology and the contexts in which these principles are implemented. To develop students' understanding of the various methods and techniques (analytical tools) of Industrial Ecology used by regional and corporate environmental managers to implement ESD principles in organisations and regions. To expose students to the practice of real-world sustainability projects and initiatives in the region.

# Course Learning Outcomes

Course Learning Outcomes
CLO1 : State and explain various definitions of sustainability, Ecologically Sustainable Development (ESD) and emerging themes such as Circular Economy (CE), apply these principles to different examples and effectively communicate progress and context
CLO2 : Apply sustainability accounting methods such as material flow analysis, environmental lifecycle assessment and footprint accounting methods for various case studies
CLO3 : Critically assess environment-related problems and the application of appropriate tools, describing the suitability of different approaches, for different outcomes and at different scales (households, corporations, regions)
CLO4 : Critically evaluate sources of information concerning sustainability dimensions, including uncertainty, both individually and collaboratively

Course Learning Outcomes	Assessment Item
CLO1 : State and explain various definitions of sustainability, Ecologically Sustainable Development (ESD) and emerging themes such as Circular Economy (CE), apply these principles to different examples and effectively communicate progress and context	<ul style="list-style-type: none"><li>• Quiz</li></ul>
CLO2 : Apply sustainability accounting methods such as material flow analysis, environmental lifecycle assessment and footprint accounting methods for various case studies	<ul style="list-style-type: none"><li>• Assignment 1</li><li>• Quiz</li></ul>
CLO3 : Critically assess environment-related problems and the application of appropriate tools, describing the suitability of different approaches, for different outcomes and at different scales (households, corporations, regions)	<ul style="list-style-type: none"><li>• Assignment 2</li><li>• Assignment 1</li><li>• Quiz</li></ul>
CLO4 : Critically evaluate sources of information concerning sustainability dimensions, including uncertainty, both individually and collaboratively	<ul style="list-style-type: none"><li>• Assignment 2</li><li>• Assignment 1</li></ul>

## Learning and Teaching Technologies

Moodle - Learning Management System

## Learning and Teaching in this course

The teaching rationale for this course includes information delivery in the form of two lectures per week, along with workshops to re-inforce and demonstrate key concepts through activities and discussions. Attendance at workshops in particular is highly encouraged. Activities in workshops are also aligned to assessments.

Content delivery is focused in the first eight weeks of the course, with the final two weeks reserved for individual work and discussion of the final assignment. There are activities such as consultations and peer review which will run in these weeks to assist in the preparation of this assessment.

# Assessments

## Assessment Structure

Assessment Item	Weight	Relevant Dates
Assignment 1 Assessment Format: Group	30%	Start Date: 20/09/2024 05:00 PM Due Date: 22/10/2024 05:00 PM
Assignment 2 Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: 18/11/2024 05:00 PM
Quiz Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: 27/09/2024 03:05 PM

## Assessment Details

### Assignment 1

#### Assessment Overview

This assignment requires the use of LCA to inform decisions in the planning, construction and operation of a house. Students will apply knowledge of LCA and life cycle thinking to calculate the lifecycle impacts for a provided case study. In the report students will also comment on data quality/suitability, alternate methods and use critical thinking skills to suggest actionable interventions. Students will prepare one group report to be submitted to Turnitin, where feedback will be provided within 2 weeks.

#### Course Learning Outcomes

- CLO2 : Apply sustainability accounting methods such as material flow analysis, environmental lifecycle assessment and footprint accounting methods for various case studies
- CLO3 : Critically assess environment-related problems and the application of appropriate tools, describing the suitability of different approaches, for different outcomes and at different scales (households, corporations, regions)
- CLO4 : Critically evaluate sources of information concerning sustainability dimensions, including uncertainty, both individually and collaboratively

#### Detailed Assessment Description

Please see Moodle for more details on assignment requirements and rubrics. This assignment will be completed in self selected groups of 3 students. Please finalise group formation by the

end of Week 3.

#### Assignment submission Turnitin type

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

#### Generative AI Permission Level

##### **Planning/Design Assistance**

You are permitted to use generative AI tools, software or services to generate initial ideas, structures, or outlines. However, you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., what is generated by the tool, software or service should not be a part of your final submission. You should keep copies of your iterations to show your Course Authority if there is any uncertainty about the originality of your work.

If your Convenor has concerns that your answer contains passages of AI-generated text or media that have not been sufficiently modified you may be asked to explain your work, but we recognise that you are permitted to use AI generated text and media as a starting point and some traces may remain. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

For more information on Generative AI and permitted use please see [here](#).

Generative AI can be very useful in providing scaffolds for assignment sections. In this assignment, your group is required to conduct an LCA for a specific casestudy. As such much of the content for your assignment will be based on the set-up, results and interpretation of the model you generate - generative AI cannot do this for you! However, you may use it to help you understand different ways to effectively present your data and construct your arguments. Please keep a record of your strategy for AI use, key prompts and output. The use of generative AI tools in editing the grammar of your submissions is appropriate.

## **Assignment 2**

#### Assessment Overview

In the second assignment, students need to prepare an individual presentation on a given topic.

The

marks for this task also include a Peer Assessment component (5%) which will run in Week 10.

The

final submission is a video submission due in Week 11 (25%). Feedback will be given directly

after the presentation.

### **Course Learning Outcomes**

- CLO3 : Critically assess environment-related problems and the application of appropriate tools, describing the suitability of different approaches, for different outcomes and at different scales (households, corporations, regions)
- CLO4 : Critically evaluate sources of information concerning sustainability dimensions, including uncertainty, both individually and collaboratively

### **Detailed Assessment Description**

To guide the direction of the assignment, a series of timeslots for consultations with teaching staff will be provided in Weeks 9 and early Week 10. Attendance and participation in these are required, you will attend these in your groups from Assignment 1 (although this assignment is individual!). Sign-up and more details are provided on Moodle.

In addition, a peer review activity will be held in the weeks preceding the final video submission in order to provide timely and formative feedback on your assignment topics and approaches. This will be set-up to run online and you may complete asynchronously - Marks (5%) will be assigned according to the quality of the feedback you provide to your peers.

Please see the assignment details and rubrics provided on Moodle.

### **Assignment submission Turnitin type**

This is not a Turnitin assignment

### **Generative AI Permission Level**

#### **Planning/Design Assistance**

You are permitted to use generative AI tools, software or services to generate initial ideas, structures, or outlines. However, you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., what is generated by the tool, software or service should not be a part of your final submission. You should keep copies of your iterations to show your Course Authority if there is any uncertainty about the originality of your work.

If your Convenor has concerns that your answer contains passages of AI-generated text or media that have not been sufficiently modified you may be asked to explain your work, but we recognise that you are permitted to use AI generated text and media as a starting point and some traces may remain. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

For more information on Generative AI and permitted use please see [here](#).

## Quiz

### Assessment Overview

The quizzes will test the students' ability to synthesise specific parts of the course, demonstrate understanding of main principles and implement them in given situations. They may include calculations,

multiple choice and short answer questions. Quizzes will be conducted in Moodle during the allocated class times. Marks will be returned immediately following the end of the quiz, or within a week depending on the question types.

### Course Learning Outcomes

- CLO1 : State and explain various definitions of sustainability, Ecologically Sustainable Development (ESD) and emerging themes such as Circular Economy (CE), apply these principles to different examples and effectively communicate progress and context
- CLO2 : Apply sustainability accounting methods such as material flow analysis, environmental lifecycle assessment and footprint accounting methods for various case studies
- CLO3 : Critically assess environment-related problems and the application of appropriate tools, describing the suitability of different approaches, for different outcomes and at different scales (households, corporations, regions)

### Detailed Assessment Description

There will be **three** quizzes run throughout the semester. Please see the specific times in Moodle.

### Assessment information

Quizzes 1 and 2 will be held during the workshop sessions in Weeks 3 and 7. See Moodle for the details of the quiz to run during Week 9.

### Assignment submission Turnitin type

Not Applicable

### Generative AI Permission Level

#### No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.

For more information on Generative AI and permitted use please see [here](#).

# **General Assessment Information**

## Grading Basis

Standard

# Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Lecture	Week 1 - Lecture 1: Wednesdays 4 - 6 pm Introduction to course, sustainability frameworks and common applications.
	Lecture	Week 1 - Lecture 2: Fridays 1 - 3 pm Carbon footprints: Theory, Requirements and Applications
	Workshop	Week 1 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Sustainable Development Goals (SDGs) and carbon footprinting requirements
Week 2 : 16 September - 22 September	Lecture	Week 2 - Lecture 1: Wednesday 4 - 6pm Guest Lecture by Deepali Ghadge: Climate Activ reporting for carbon neutrality of companies, products and more
	Lecture	Week 2 - Lecture 2: Fridays 1 - 3 pm Introduction to Lifecycle assessment (LCA)
	Workshop	Week 2 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Increasing complexity - carbon footprints to lifecycle assessment
Week 3 : 23 September - 29 September	Lecture	Week 3 - Lecture 1: Wednesdays 4 - 6 pm Using OpenLCA and detailed discussion of the group assignment.
	Lecture	Week 3 - Lecture 2: Fridays 1 - 3 pm Dealing with data quality, uncertainty and sensitivity in sustainability assessment
	Workshop	Week 3 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Addressing uncertainty in sustainability assessment Note: Your groups approach for your assignment will be discussed during this session.
	Assessment	Quiz 1 will be held during the start of the workshop session. See Moodle for details
Week 4 : 30 September - 6 October	Lecture	Week 4 - Lecture 1: Wednesdays 4 - 6 pm Assessing infrastructure and buildings using frameworks (Envision, Greenstar, ISCA etc)
	Lecture	Week 4 - Lecture 2: Fridays 1 - 3 pm Circularity and material flow analysis
	Workshop	Week 4 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Material assessments with applications to circular infrastructure designs
Week 5 : 7 October - 13 October	Lecture	Week 5 - Lecture 1: Wednesdays 4 - 6 pm Environmental Footprints : Material and Water footprints
	Lecture	Week 5 - Lecture 2: Fridays 1 - 3 pm Environmental Footprints: Ecological footprints
	Workshop	Week 5 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Understanding, conducting and communicating environmental footprints - other methods beyond carbon footprints.
Week 7 : 21 October - 27 October	Lecture	Week 7 - Lecture 1: Wednesdays 4 - 6 pm Sustainability reporting
	Assessment	Group Assessment due Tuesday 22nd October at 5pm - See Moodle for more details
	Lecture	Week 7 - Lecture 2: Fridays 1 - 3 pm Environmental Management Plans for companies
	Workshop	Week 7 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: UNSW environmental management casestudy - tour and discussion
	Assessment	Quiz 2 - Will run during the start of the workshop sessions (3:05pm)- See Moodle for more details.
Week 8 : 28 October - 3 November	Lecture	Week 8 - Lecture 1: Wednesdays 4 - 6 pm Environmental Impact Assessment for projects
	Lecture	Week 8 - Lecture 2: Fridays 1 - 3 pm Examples of environmental impact management approaches
	Workshop	Week 8 - Workshops: Fridays 3 - 5 pm Overview of topics relevant to this weeks content: Reporting and managing

		environmental impacts in EIA and EMS
Week 9 : 4 November - 10 November	Other	<p>Consultations - During the contact hours this week and in Week 10, timeslots will be available for you to meet and discuss your approach for your individual assignment with the teaching team. This is a requirement for your assignment to attend one session. Please see Moodle for the signup and more details as to how this activity will run.</p> <p>Please also prepare for the submission of a draft project proposal outline - or draft video presentation to be submitted this week - for the peer review activity to be run in Week 10 (which is worth 5%).</p> <p>During the remainder of the week you will have time to work on your final assignment.</p>
	Assessment	Your final quiz will run this week, it will be attempted during the workshop session. Please see Moodle for more details.
Week 10 : 11 November - 17 November	Other	<p>Consultations - During the contact hours this week (same as in Week 9), timeslots will be available for you to meet and discuss your approach for your individual assignment with the teaching team. This is a requirement for your assignment to attend one session. Please see Moodle for the signup and more details as to how this activity will run.</p> <p>You will also be participating in a Peer Review activity to provide formative feedback to your peers - worth 5% of your grades.</p> <p>During the remainder of the week you will have time to work on your final assignment.</p>
Week 11 : 18 November - 24 November	Assessment	The video presentation for the individual assessment is due by Tuesday 19th November at 5pm. The submission will be uploaded - see Moodle for more details.

## Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

## Course Resources

### Prescribed Resources

There are no texts set for this subject. Course notes via .pdf files as well as multimedia resources are provided for this course in Moodle

## Course Evaluation and Development

We encourage student feedback in all forms regarding how the course is run and administered. As both undergraduate and postgraduate students take this course we are interested to hear from all stakeholders.

## Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Ruth Fisher		H20 Rm 311		Please contact through the forums; or via email to organise a time	Yes	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 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, 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](http://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 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 this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.