

CEIC4000

Environment and Sustainability

Term 2, 2022



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Graeme Bushell	g.bushell@unsw.edu.au	During office hours on Teams	Hilmer room 219	9385 5921

School Contact Information

Enquiries related to the course (e.g. course content, assessment instructions) should be raised during the scheduled classes, office hours, or in Teams channels/Moodle forums designated for that purpose.

Learning and question etiquette:

- Please be prepared for classes and attend the timetabled classes so that you can ask questions during the class time.
- Please respect that demonstrators and tutors have scheduled the class time to help you learn and are likely to be busy with other responsibilities outside those times; questions asked outside of class times will take longer to be answered.
- PhD students and other casuals who are teaching classes are normally only expected to look after the timetabled class and not to provide follow-up one-on-one assistance.
- Please don't ask questions in private that could be reasonably asked in a way that everyone can learn from the discussion.
- As a member of a community of learners, please try answering each other's questions!
- Please limit private messages to staff (via email or Teams) to *confidential* matters related to course administration.

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.

If circumstances outside your control impact on submitting assessments, Special Consideration may be granted, usually in the form of an extension or a supplementary assessment. Applications for Special Consideration must be submitted [online](#).

Course Details

Units of Credit 6

Summary of the Course

We hear every day about the destruction of forests, plastic in the oceans and carbon dioxide in the atmosphere. We hear that we all need to change, because our current lifestyles are unsustainable: eat less meat, drive less car, recycle our plastic and compost our food waste. But is it enough?

How much change do we need, to have a sustainable world?

What should engineers do to help us achieve it, and why?

In this course we will grapple with these big questions. You'll be able to take an in-depth look at a sustainability issue that you're passionate about: its causes, consequences and implications. You'll also hear about lots of other issues that you'd never even heard of before, and will develop the critical skills to challenge sloppy sustainability thinking wherever you find it.

You'll also start to develop an understanding of the way our society, economy and environment interact, to make sense out of chaotic and rapidly changing world; and develop your ability to use ethical thinking to decide how you ought to behave in it.

Course Aims

This course is about about the sustainability of various human activities (most of which are directly or indirectly related to engineering) across a range of potentially limiting environmental circumstances. It aims to raise awareness of these issues and the use of sustainability tools to assess their status, or our performance in attempting to mitigate their impact and change our behaviour.

Consideration of these matters raises fundamental ethical questions, and hence the opportunity is taken to examine what ethical practice as a professional engineer means.

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Be aware of the causes and societal implications of a range of sustainability issues, with the ability to discuss at least one issue in detail	PE1.5
2. Assess the impact of environmental issues on economic, social and environmental sustainability	PE1.3, PE1.6, PE1.5, PE2.1, PE3.4
3. Advocate an ethical role for the professional engineer in the sustainability context	PE3.1, PE3.2, PE3.3
4. Develop and communicate a logical argument	PE3.2, PE3.4
5. Critically assess the arguments of others	PE3.2, PE3.5

Teaching Strategies

The course is designed around the delivery of a major assignment, which asks you to investigate a sustainability issue of your choice, in some depth, and to evaluate the role that engineering ought to play in the situation.

As we go through the term there are lectures, readings and activities to develop the concepts and ideas that need to be applied in the assignment - with multiple ways to engage. Regular and detailed feedback, at both personal and class levels (through peer evaluation) ensures that unfamiliar concepts are understood and properly applied.

Classes are offered in either fully online, or in blended mode (online lecture discussions with face-to-face tutorials).

Assessment

The indicated word limits will be strictly applied, and are as measured by Turnitin, **NOT** as determined by your word processor or any other means. If you submit something over the word limit it will be returned to you for editing and resubmission. This may result in you incurring a late penalty.

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Participation	15%	Not Applicable	1, 5
2. Assignment Draft	15%	19/06/2022, 10/07/2022, 24/07/2021 9pm	2, 3, 4
3. Evaluations	20%	Not Applicable	1, 5
4. Assignment	50%	12/08/2021 09:00 PM	1, 2, 3, 4

Assessment 1: Participation

During term. Participation is recognised for tutorial activities as described in the schedule. Participation means you attempt all the aspects of the activity, such that meaningful feedback can be provided.

This is not a Turnitin assignment

Assessment 2: Assignment Draft

Assessment length: 1000 words maximum, each part

Due date: 19/06/2022, 10/07/2022, 24/07/2021 9pm

Early written work primarily for feedback

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Additional details

Word limit is *as determined by Turnitin*, and includes the bibliography.

You may, **optionally**, also submit your drafts through the Evaluation workshop tool in moodle. If you do this, your work will be peer reviewed and possibly discussed during tutorial. This will help the rest of the class through the discussion of general principles that may apply to their own work, and will help you through more detailed, and earlier, feedback than you would otherwise receive.

Assessment 3: Evaluations

During term. Assignment drafts and participation activities are peer evaluated (see course schedule). Evaluation marks are awarded to you based on how closely your evaluation of the given work matches the tutor's assessment of the same work. Your evaluation work provides feedback points to the person you are assessing.

This is not a Turnitin assignment

Assessment 4: Assignment

Assessment length: 3000 words maximum

Due date: 12/08/2021 09:00 PM

Integrative and summative assignment

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Additional details

Word limit is as determined by Turnitin, and includes the bibliography.

Attendance Requirements

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

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
O-Week: 23 May - 27 May	Online Activity	Read the course outline. Complete "Introductory quiz" to release course content (100% mark required, unlimited attempts allowed) Complete "Your Views" survey for 15% of PARTICIPATION marks
Week 1: 30 May - 3 June	Lecture	Lecture (in Teams, recorded). The UN sustainable development goals. What does sustainability mean, what is a sustainability issue. How it is different to sustainable development. A stocks and flows framework. Environmental, economic and social sustainability. The tragedy of the commons. Course and assessment briefing.
	Tutorial	Sustainability and sustainable development discussion. Assignment topic selection. 15% of PARTICIPATION marks.
Week 2: 6 June - 10 June	Lecture	Lecture (in Teams, recorded). Sustainability metrics and indicators. What they are and how they work. Simple metrics assess direct contribution to the change. Footprints include indirect contributions. Safe limits and the idea of absolute assessment. The Daly rules. Planetary boundaries and biogeochemical cycles.
	Tutorial	Sustainability assessment. 15% of PARTICIPATION marks.
Week 3: 13 June - 17 June	Lecture	Queen's birthday public holiday - no live class this week. Watch Joshua Greene's talk online before tutorial.
	Tutorial	Ethics discussion 1. 15% of PARTICIPATION marks.

	Assessment	Assignment draft, part 1 is due 19th June Sunday night 9pm. 33% of DRAFT marks
Week 4: 20 June - 24 June	Lecture	Lecture (in Teams, recorded). Review of metrics, absolute and relative. Dynamics are critical to understanding sustainability. Resource depletion dynamics. Population dynamics modelling. Ecological overshoot.
	Tutorial	Evaluate draft submissions with peers during tutorial. Enter your assessments in moodle for 25% of EVALUATION marks.
	Online Activity	Next week's tutorial has the opportunity for a limited number of students to present their approach for part 2 of the assignment draft, during the tutorial. REGISTER to do this using the sign-up tool in moodle if you're interested.
Week 5: 27 June - 1 July	Lecture	Lecture (in Teams, recorded). Expert guest: Soo Huey Teh on Life Cycle Assessment (LCA)
	Tutorial	Present your ideas for part 2 of the assignment for 30% of PARTICIPATION marks (pre-registration required). Evaluate your peers' presentations in moodle for 25% of EVALUATION marks.
Week 6: 4 July - 8 July	Reading	Flex week - no formal classes. Use this week for reading and to develop your assignment.
	Assessment	Assignment draft, part 2 is due 10th July Sunday night 9pm. 33% of DRAFT marks.
Week 7: 11 July - 15 July	Lecture	Lecture (in Teams, recorded). Expert guest Stephen Cohen – Ethical frameworks, elements of moral reasoning, and professional ethics.
	Tutorial	Ethics discussion 2. 15% of PARTICIPATION marks.
Week 8: 18 July - 22 July	Lecture	Lecture (in Teams, recorded). Understanding social collapse – population dynamics, structural demographics theory, and historical examples.
	Tutorial	Ethics discussion 3. 15% of PARTICIPATION marks.
	Assessment	Assignment draft, part 3 is due 24th July Sunday night 9pm. 34% of DRAFT marks.
Week 9: 25 July - 29 July	Lecture	Lecture (in Teams, recorded). The Limits to Growth

	Tutorial	Evaluate draft submissions with peers during tutorial. Enter your assessments in moodle for 25% of EVALUATION marks .
	Online Activity	Next week's tutorial has the opportunity for a limited number of students to present a precis of their assignment draft, during the tutorial. REGISTER to do this using the sign-up tool in moodle if you're interested.
Week 10: 1 August - 5 August	Lecture	<p>Lecture (in Teams, recorded).</p> <p>Expert guests Professionals Australia – succeeding with an engineering career in an uncertain world. Zoom link to be provided.</p> <p>Film screening with live chat - Surviving Progress (this is also available to rent or buy on YouTube - for those who can access it that way).</p>
	Tutorial	Present a precis of your assignment for 30% of PARTICIPATION marks (pre-registration required). Evaluate your peers' presentations in moodle for 25% of EVALUATION marks .
	Online Activity	Complete an online survey for 15% of PARTICIPATION marks .
Study Week: 8 August - 11 August	Assessment	Final assignment due Friday 12th August, 9pm.

Resources

Prescribed Resources

Videos, recorded lectures, required and suggested readings, tutorial sessions and recordings, plus links to other online resources will be provided on the course moodle page (<https://moodle.telt.unsw.edu.au/course/view.php?id=67789>).

Course Evaluation and Development

Feedback on course design and implementation is encouraged, at any time but particularly through the myExperience survey at the end of term. There were several minor issues identified in the previous implementation that have now been tidied up: adjustment of the assignment brief to make it more relatable to the individual, and some edits to lectures to highlight the fundamental significance of the difference between stocks and flows.

Submission of Assessment Tasks

In the School of Chemical Engineering, all written work will be submitted for assessment via Moodle unless otherwise specified. Attaching cover sheets to uploaded work is generally not required; when you submit work through Moodle for assessment you are agreeing to uphold the Student Code.

Some assessments will require you to complete the work online and it may be difficult for the course coordinator to intervene in the system after the due date. You should ensure that you are familiar with assessment systems well before the due date. If you do this, you will have time to get assistance before the assessment closes.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

Late penalties

Unless otherwise specified, submissions received after the due date and time will be penalised at a rate of 5% per day or part thereof (including weekends). For some activities including Moodle quizzes and Team Evaluation surveys, extensions and late submissions are not possible.

Special consideration

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 submitting an assessment or sitting an exam.

UNSW has a [Fit to Sit / Submit rule](#), which means that if you attempt an exam or submit a piece of assessment, 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](#).

Please note that students will need to provide some documentary evidence to support absences from any assessments missed because of COVID-19 public health measures such as isolation. UNSW will **not** be insisting on medical certificates for COVID-related absences of 7 days or less, with the positive PCR or RAT result being sufficient. Longer absences due to self-isolation or COVID-related illness will still need documentation such as a medical certificate.

Applications for special consideration **will still be required** for assessment and participation absences related to COVID-19. Special consideration requests should not be lodged for missing classes if there are no assessment activities in that class.

Academic Honesty and Plagiarism

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage (International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013). At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and plagiarism can be located at:

- The [Current Students site](#)
- The [ELISE training site](#)

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>.

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism. Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>.

For assessments in the School of Chemical Engineering, we recommend the use of referencing software such as [Mendeley](#) or [EndNote](#) for managing references and citations. Unless required otherwise specified (i.e. in the assignment instructions) students in the School of Chemical Engineering should use either the APA 7th edition, or the American Chemical Society (ACS) referencing style as canonical author-date and numbered styles respectively.

Academic Information

To help you plan your degree, assistance is available from academic advisors in [The Nucleus](#) and also in the [School of Chemical Engineering](#).

Additional support for students

- [Current Student Gateway](#)
- [Engineering Current Student Resources](#)
- [Student Support and Success](#)
- [Academic Skills](#)
- [Student Wellbeing, Health and Safety](#)
- [Equitable Learning Services](#)
- [IT Service Centre](#)

Course workload

Course workload is calculated using the Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

On-campus class attendance

Physical distancing recommendations must be followed for all face-to-face classes. To ensure this, only students enrolled in those classes will be allowed in the room. Class rosters will be attached to corresponding rooms and circulated among lab demonstrators and tutors. No over-enrolment is allowed in face-to-face class. Students enrolled in online classes can swap their enrolment from online to a **limited** number of on-campus classes by Sunday, Week 1.

In certain classroom and laboratory situations where physical distancing cannot be maintained or the staff running the session believe that it will not be maintained, face masks will be designated by the course coordinator as **mandatory PPE** for students and staff. Students are required to bring and use their own face mask. Mask can be purchased from IGA Supermarket (Map B8, Lower Campus), campus pharmacy (Map F14, Middle Campus), the post office (Map F22, Upper Campus) and a vending machine in the foyer of the Biological Sciences Building (Map E26, Upper Campus).

Your health and the health of those in your class is critically important. You must stay at home if you are sick or have been advised to self-isolate by [NSW health](#) or government authorities. Current alerts and a list of hotspots can be found [here](#). Do not come to campus if you have any of the following symptoms: fever (37.5 °C or higher), cough, sore throat, shortness of breath (difficulty breathing), runny nose, loss of taste, or loss of smell. If you need to have a COVID-19 test, you must not come to campus and remain in self-isolation until you receive the results of your test.

You will not be penalised for missing a face-to-face activity due to illness or a requirement to self-

isolate. We will work with you to ensure continuity of learning during your isolation and have plans in place for you to catch up on any content or learning activities you may miss. Where this might not be possible, an application for fee remission may be discussed. Further information is available on any course Moodle or Teams site.

For more information, please refer to the FAQs: <https://www.covid-19.unsw.edu.au/safe-return-campus-faqs>

Note: This course outline sets out 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 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 (as updated in Moodle), the description in the Course Outline/Moodle applies.

Image Credit

Photo by [Casey Horner](#) on [Unsplash](#)

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	✓
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	✓
PE2.2 Fluent application of engineering techniques, tools and resources	
PE2.3 Application of systematic engineering synthesis and design processes	
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	✓
PE3.2 Effective oral and written communication in professional and lay domains	✓
PE3.3 Creative, innovative and pro-active demeanour	✓
PE3.4 Professional use and management of information	✓
PE3.5 Orderly management of self, and professional conduct	✓
PE3.6 Effective team membership and team leadership	