



# CVEN9898

## Fundamentals of Sustainable Infrastructure

Term One // 2021

## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Ruth Fisher	ruth.fisher@unsw.edu.au		H20 Rm 205	(02) 9385 5073

#### Lecturers

Name	Email	Availability	Location	Phone
Vinayak Dixit	v.dixit@unsw.edu.au			
Baran Yildiz	baran.yildiz@unsw.edu.au			
Ademir Abdala Prata Junior	ademir@unsw.edu.au			

### School Contact 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)

## Course Details

### Credit Points 6

### Summary of the Course

The course provides a theoretical background to the sustainability aspects of water and waste management, transport services, energy supply and distribution. The theory will then be applied to the analysis and design of sustainable infrastructure case studies, involving economic, resource and population constraints.

This course covers the analysis of infrastructure in a number of areas, including the following:

- Transport systems
- Energy systems
- Water systems
- Waste management systems
- Planning influences on urban infrastructure
- Use of Life Cycle Assessment (LCA) and sustainability ratings for the selection of infrastructure design.

It provides a regional planning context to the planning and design of infrastructure and provides a series of case studies to illustrate the principles of sustainable infrastructure design.

### Course Aims

The course aims to have students gain the following attributes:

- A respect for ethical practice and social responsibility
- Skills for effective communication
- An in-depth engagement with the relevant civil and environmental engineering knowledge related to infrastructure design in its inter-disciplinary context
- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning
- Information literacy
- Skills for collaborative and multi-disciplinary work

### Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Analyze infrastructure provision problems at the regional scale of a city.	PE2.1, PE2.2, PE2.3, PE2.4
2. To describe the fundamental concepts underpinning the provision of Sustainable Infrastructure solutions	PE1.1, PE1.5, PE1.6
3. To generate solution options and evaluate their feasibility in terms of sustainability outcomes	PE3.2, PE3.4

## Teaching Strategies

Students will undertake a variety of individual and group assessment components that are associated with course objectives. Details of each assessment component, the marks assigned to it, and the dates of submission are set out below in “Assessment Overview”.

Students will work in groups for the Background Report and the Final Report. Only one submission is allowed to be submitted per group (Your first submission is your final submission). All assessment submissions will be through Turnitin.

Assessment details and rubrics can be found in Moodle. The final grade for this course will be based on the sum of the scores from each of the assessment tasks. There is no final exam for this course.

## Assessment

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

### Assessment Tasks

Assessment task	Weight	Due Date	Student Learning Outcomes Assessed
Background Report	30%	29/03/2021 11:59 PM	1, 2
Online Quizzes	20%	See Moodle for Schedule	2
Final Report	50%	23/04/2021 11:59 PM	1, 3

### Assessment Details

#### Assessment 1: Background Report

##### Details:

Group report detailing the background for their casestudy site and identifying sustainability targets.

##### Additional details:

See Moodle for assessment details and rubric

**Submission notes:** Through Turnitin, one per group

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

#### Assessment 2: Online Quizzes

**Start date:** Not Applicable

##### Details:

*The four online quizzes on Transport, Energy, Water and Waste 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.*

##### Additional details:

See quiz guidance documents on Moodle

**Submission notes:** Quizzes will be completed online through Moodle

**Turnitin setting:** This is not a Turnitin assignment

## **Assessment 3: Final Report**

### **Details:**

Group reports will contain designs for the provision of Transport, Energy, Water and Waste for the casestudy area. Marks will be assigned according to content, presentation.

### **Additional details:**

See Moodle for Report requirements for each theme (Transport, Energy, Water and Waste)

**Submission notes:** One copy of each report per group to the relevant submission links

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

## Attendance Requirements

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

## Course Schedule

[View class timetable](#)

### Timetable

Date	Type	Content
Week 1: 15 February - 19 February	Lecture	Introduction to course, Case study overview, Sustainability, (Ruth Fisher)
	Workshop	Infrastructure Rating Systems & Workshop
Week 2: 22 February - 26 February	Lecture	Transport (Vinayak Dixit)
	Workshop	Transport
Week 3: 1 March - 5 March	Lecture	Energy (Baran Yildiz)
	Workshop	Energy
	Assessment	Transport Quiz
Week 4: 8 March - 12 March	Lecture	Water (Ademir Abdala Prata Junior)
	Workshop	Water
	Assessment	Energy Quiz
Week 5: 15 March - 19 March	Lecture	Waste (Ruth Fisher)
	Workshop	Waste
	Assessment	Water Quiz
Week 6: 22 March - 26 March		Flexibility Week
Week 7: 29 March - 2 April	Assessment	Background Report due
	Assessment	Waste Quiz
Week 8: 5 April - 9 April	Workshop	Feedback and Discussion Sessions (All Themes)
Week 9: 12 April - 16 April	Workshop	Feedback and Discussion Sessions (All Themes)
Week 10: 19 April - 23 April	Assessment	Final Report Due

## Resources

### Prescribed Resources

- Additional materials provided on OpenLearning.
- Textbook (online version available at the UNSW library):
  - [Sarté, S. B. \(2010\). Sustainable infrastructure : the guide to green engineering and design. Hoboken, N.J.: Wiley.](#)

### Recommended Resources

### Course Evaluation and Development

## **Submission of Assessment Tasks**

Please refer to the Moodle page of the course for further guidance on assessment submission.

## Academic Honesty and 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 Information

[Key UNSW Dates](#) - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.

### Final Examinations:

Final exams in Term 1 will be held online between 30th April - 13th May inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

### Supplementary Examinations:

Supplementary Examinations for Term 1 2021 will be held on 24th - 28th May inclusive should you be required to sit one. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

## ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism;
- Special Considerations: [student.unsw.edu.au/special-consideration](https://student.unsw.edu.au/special-consideration);
- General and Program-specific questions: [The Nucleus: Student Hub](#)
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC/SURVSOC/CEPCA

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>

## Image Credit

Synergies in Sound 2016

## 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	