

CVEN4701

Planning Sustainable Infrastructure

Term 2, 2023



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
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Lecturers

Name	Email	Availability	Location	Phone
Juan Pablo Gaitan	j.alvarezgaitan@unsw.edu.au			
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James Hayes	j.e.hayes@unsw.edu.au			
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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

Units of Credit 6

Summary of the Course

The course builds on introductory knowledge from Stages 1 to 3 in water, transport, waste and engineering operation and enable students to design infrastructure systems that include social and cultural context, as well as having regard to sustainability principles in the planning of urban and regional precincts. The design brief will direct the conceptual planning of the infrastructure and allow students to be more familiar with sustainability in terms of water and waste management, transport services, energy supply and distribution. The capstone course will encourage independent, reflective learning and teamwork through the delivery of individual and group assessment tasks that allows for critical thinking and the development of creative and appropriate sustainable outcomes in urban and regional communities.

Course Aims

The course aims to enables engineers to analyse and design sustainable infrastructure to support the needs of urban and regional economies and populations. It builds on and applies the core concepts learned in introductory tools, water, transport and engineering operation courses in Stages 1 to 3 of the program.

The course provides complementary learning using different urban or regional context to the planning and design of infrastructure in the areas of water and waste management, transport services, energy supply and distribution.

The course introduces planning approaches to enable system thinking for a specific design brief, addressing macro to asset specific scale concerns, societal, cultural and environmental concepts, so that appropriate sustainable outcomes are enabled for urban and regional communities.

Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Critically assess infrastructure sustainability at varying scales and contexts	PE1.1, PE1.2, PE1.3, PE1.5
2. Solve regional and rural infrastructure problems using sustainability principles	PE1.3, PE1.4, PE1.5, PE1.6, PE2.1, PE2.3
3. Display creativity by creating infrastructure solutions that may not be conventional	PE1.2, PE1.4, PE2.1, PE2.2, PE2.3
4. Carry out a literature review, work independently, work in a group and present findings effectively	PE1.4, PE3.1, PE3.2, PE3.4, PE3.6

Teaching Strategies

The course is delivered as capstone design with students working in groups. The groups will be working as an intra-disciplinary team and will be required to produce several planning, technical and presentation tasks either as an individual or as a group assessment. Group members will need to self-select groups based on a mix of individuals with different technical and professional skills. Your group will work individually to deliver a series of four technical reports (Water, Waste, Transport and Energy), each led by one group member. Information from your technical reports will be used to prepare a group 3-minute video presentation for your overall design with a focus towards improving sustainable practice of the design brief infrastructure. Throughout the term you will display your individual and group professional practice, skills and teamwork through your project management reporting, group interview and professional development modules.

Additional Course Information

The course builds on fundamentals from courses in Years 1, 2, and 3, plus the design of components of various infrastructure covered in:

- CVEN1701 Environmental Principles
- DESN1000 Engineering Design and Innovation
- CVEN2402 Transport Engineering and Environmental Sustainability
- DESN2000 Engineering Design and Professional Practice
- CVEN3502 Water and Wastewater Engineering
- CVEN3103 Engineering Operations and Control

Assessment

Students will undertake a variety of individual and group assessment tasks that are associated with course objectives.

Groups with four members will be self-selected using groups on Moodle by end of Week 1.

For group assessment items, only one submission is allowed to be submitted per group (Your first submission is your final submission). All assessment submissions will be through Moodle and/or Turnitin.

Assessment components, the marks assigned to each task, and the dates of submission are set out below and on Moodle. See assessment details on individual and group assignments on Moodle.

Penalties for late submissions will be penalised at the rate of 5% per day after the due date and time have expired.

All group members are required to attend the peer marking of video presentation (Week 9) and project management report interview (Week 11) for satisfactory completion of the assessment task.

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Online Quiz	15%	15/6/23 6PM	1, 2
2. Presentation	15%	23/7/23 11:59 PM	2, 3, 4
3. Project management and Professional Development	25%	Part A - 4/8/23 11:59 PM; Part B - see Moodle	4
4. Technical report	45%	30/7/23 11:59 PM	2, 3, 4

Assessment 1: Online Quiz

Start date: 15/6/23 4PM

Assessment length: 15 Multiple choice questions

Due date: 15/6/23 6PM

Marks returned: Within 1 week

Technical assessment of sustainability principles, critical thinking, self-reflection and professional attributes.

Assessment criteria

Individual online quiz conducted during class (week 3) (see Moodle for details).

Assessment 2: Presentation

Start date: 29/5/23

Assessment length: 3 minute group video presentation

Due date: 23/7/23 11:59 PM

Marks returned: Within 3 weeks

Video presentation on the integration of discipline subject matter with the social, cultural and/or environmental background for case study location.

Additional details

Peer marking of group video presentations will occur on Thursday July 27 between 1-3pm (week 9).

All group members are required to attend for satisfactory completion of this assessment task.

Assessment 3: Project management and Professional Development

Start date: 29/5/23

Assessment length: Part A - Report and group interview; Part B - 2 Online modules (see Moodle)

Due date: Part A - 4/8/23 11:59 PM; Part B - see Moodle

Marks returned: Within 3 weeks

Part A - Project management report on the management of assessment task by groups (see Moodle for details)

Part B - Professional development assessment tasks (see Moodle for module details)

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

Assessment criteria

Part A - Group assessment project management report and group interview (during week 11)

Part B - Individual ongoing professional development modules (See Moodle for Details).

Additional details

Part A - Group interviews will occur on Tuesday 22/11/22 (week 11).

All group members are required to attend for satisfactory completion of the assessment task.

Assessment 4: Technical report

Start date: 29/5/23

Assessment length: 10 pages written report plus Appendix

Due date: 30/7/23 11:59 PM

Marks returned: Within 4 weeks

Technical assessment on either water, waste, transport or energy for case study location.

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

Assessment criteria

Individual assessment (see Moodle for details)

Attendance Requirements

Course Schedule

Refer to Course Schedule for lectures and workshops for each week, indicating the topics and the names of presenter involved, assessment workshops, group consultation workshops, and group and individual assessment activities.

Submission of Assessment Tasks

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

UNSW has a standard late submission penalty of:

- 5% per day, for all assessments where a penalty applies, capped at five days (120 hours), after which a student cannot submit an assessment, and no permitted variation.

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

Final Examinations:

Final Exams in T2 2023 will be held on campus between Friday 11th and Thursday 24th August (inclusive), and Supplementary Exams between Monday 4th and Friday 8th September (inclusive). You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

For students enrolled in the distance offering of a postgraduate course, and who reside further than 100km from UNSW Kensington campus, will be contacted regarding sitting an external exam. The school's External Exam Policy can be found on the Intranet.

ACADEMIC ADVICE

- Key Staff to Contact for Academic Advice (log in with your zID and password): <https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw>
- [Key UNSW Dates](#) - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.
- CVEN Student Intranet (log in with your zID and password): <https://intranet.civeng.unsw.edu.au/student-intranet>
- Student Life at CVEN, including Student Societies: <https://www.unsw.edu.au/engineering/civil-and-environmental-engineering/student-life>
- Special Consideration: <https://student.unsw.edu.au/special-consideration>
- General and Program-Specific Questions: [The Nucleus: Student Hub](#)
- Book an Academic Advising session: <https://unswengacademicadvising.as.me/schedule.php>

Disclaimer

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

Aerial picture of Long Bay Correctional Complex (source: Google)

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	✓