

CVEN3702

Solid Wastes and Contaminant Transport

Term 3, 2022



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Denis O'Carroll O'Carroll	d.ocarroll@unsw.edu.au	Upon request	WRL & Room 312 of H20	

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

An introduction to waste management systems, from generation to treatment and disposal; including waste characterisation, waste minimisation, transfer stations, recycling facilities, composting and landfill design. Contamination of receiving environments from poor waste disposal, including pollutant sources, spreading of contaminants in air and water, transport processes in rivers, estuaries, lakes and coastal waters.

Course Aims

In the Solid Waste component, the objectives of this course are to:

Provide an appreciation of the management of solid waste in a systems context; ie to understand the nature of the various functional elements in regional waste management systems and the relationships among them, so that optimal systems can be designed.

Provide an understanding of the characteristics of urban solid waste, and be able to estimate the composition and quantities for any region.

Be able to understand the data requirements for, and then be able to prepare concept designs of, common functional elements (e.g. transfer stations, material recovery facilities, landfills, treatment plants) in solid waste management systems.

In the Contaminant Transport component, the objectives are to:

Provide an understanding of the fundamental processes of tracer or pollutant movement in the biosphere. Specifically, this will include surface waters (rivers, estuaries, tidal inlets, lakes, the nearshore coastal region) and the atmosphere.

Provide you with the skills to enable you to apply theory to solve problems and make estimates of pollution levels in the environment.

Course Learning Outcomes

1. Design a waste management strategy.
2. Apply contaminant transport models to predict the movement of contaminants in the environment.
3. Create a waste flow concept from a municipal source to ultimate disposal.
4. Explain how contaminants move through the environment.

1.	<i>Apply the design concepts to design a waste management strategy.</i>	<i>PE1.1, PE1.5, PE2.3</i>
2.	<i>Apply the best use of contaminant transport conceptual models to predict the movement of contaminants in the environment.</i>	<i>PE1.2, PE2.2, PE2.3</i>
3.	<i>Create a concept of waste flow from a municipal source to ultimate disposal.</i>	<i>PE1.2, PE2.2, PE2.3</i>
4.	<i>By the conclusion of this course the student will be able to develop knowledge and skills understanding how contaminants move through the environment.</i>	<i>PE2.2, PE2.3, PE3.3</i>

Teaching Strategies

Please refer to the information in Moodle

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Waste Facility Design Assignment - Part 1	10%	30/09/2022 11:00 AM	1, 3
2. Waste Facility Design Assignment - Part 2	10%	16/10/2022 11:59 PM	1, 3
3. Contaminant Transport Assignment	20%	18/11/2022 11:00 AM	2, 4
4. Exam	60%	Not Applicable	1, 2, 3, 4

Assessment 1: Waste Facility Design Assignment - Part 1

Due date: 30/09/2022 11:00 AM

Assess the understanding of the concepts, data collection, calculations and reporting. Section 1 is the data gathering and calculations

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

Assessment criteria

To be communicated.

Assessment 2: Waste Facility Design Assignment - Part 2

Due date: 16/10/2022 11:59 PM

Assess the understanding of the concepts, data collection, calculations and reporting.

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

Assessment criteria

To be communicated

Assessment 3: Contaminant Transport Assignment

Due date: 18/11/2022 11:00 AM

Assess the extent of contaminant transport, including mechanisms.

This is not a Turnitin assignment

Assessment criteria

To be communicated

Assessment 4: Exam

Final exam will cover solid waste management and contaminant transport components of the course

Hurdle requirement

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

Attendance Requirements

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

Course Schedule

Date	Lecturer	Topic
14/09/2022 (Week 1)	Denis O'Carroll	Course Introduction
15/09/2022 (Week 1)	Guest lecturer – Dr. Stuart Dever - Kimbriki Resource Recovery Centre	Introduction to Landfills
21/09/2022 (Week 2)	Denis O'Carroll	Waste Minimisation
22/09/2022 (Week 2)	Denis O'Carroll	Waste Generation & Characterization
28/09/2022 (Week 3)	Denis O'Carroll	Waste Collection & Transfer
29/09/2022 (Week 3)	Denis O'Carroll	Composting & MBT
05/10/2022 (Week 4)	Denis O'Carroll	Waste to Energy
06/10/2022 (Week 4)	Guest lecturer – Dr. Stuart Dever - Kimbriki Resource Recovery Centre	Landfill Leachate
12/10/2022 (Week 5)	Denis O'Carroll	Waste to Energy (continued)
13/10/2022 (Week 5)	Guest lecturer – Dr. Stuart Dever - Kimbriki Resource Recovery Centre	Landfill Gas
26/10/2022 (Week 7)	Denis O'Carroll	Processes of contaminant transport
27/10/2022 (Week 7)	Denis O'Carroll	Processes of contaminant transport (continued)
02/11/2022 (Week 8)	Denis O'Carroll	Jets, plumes and buoyant jets
03/11/2022 (Week 8)	Denis O'Carroll	Jets, plumes and buoyant jets (continued)
09/11/2022	Denis O'Carroll	Estuaries: classification and circulation

(Week 9)		
10/11/2022	Denis O'Carroll	Estuaries: classification and circulation (continued)
(Week 9)		
16/11/2022	Denis O'Carroll	Atmospheric dispersion
(Week 10)		
17/11/2022	Denis O'Carroll	Atmospheric dispersion (continued)
(Week 10)		

[View class timetable](#)

Timetable

Date	Type	Content
O-Week: 5 September - 9 September		
Week 1: 12 September - 16 September	Lecture	
Week 3: 26 September - 30 September	Assessment	Waste Facility Design Assignment - Part 1
Week 10: 14 November - 18 November	Assessment	Contaminant Transport Assignment

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 T3 2022 will be held online between 25th November - 8th December 2022 inclusive, and supplementary exams between 9th - 13th January 2023 inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

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://app.acuityscheduling.com/schedule.php?owner=19024765>

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

Mike Gal.

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.