

## COURSE DETAILS

<b>Units of Credit</b>	6
<b>Contact hours</b>	4 hours per week
<b>Class</b>	Tuesdays, 11am-1pm online
<b>Workshop</b>	Thursdays, 2-4 pm online

**Course Coordinator and Lecturer** Dr Ailar Hajimohammadi  
email: ailar.hm@unsw.edu.au

**Lecturer** Dr Ademir Prata  
email: ademir@unsw.edu.au

**Guest Lecturer** Dr Richard Collins  
Email: richard.collins@unsw.edu.au

**Demonstrator** Ms Maryam Farzadkhoo  
Email: maryam.farzadkhoo@unsw.edu.au

## INFORMATION ABOUT THE COURSE

- No prerequisites, but it is suggested that CVEN9872 Solid Waste Management, CVEN9884 Environmental Engineering Science I (or equivalent course) be completed prior to this subject.
- Waste audits and characterisation of hazardous wastes in regions and industries.
- Control of generation and transport of hazardous waste, manifest systems.
- Waste minimisation; on-site treatment methods; integrated off-site treatment facilities; management of residues from treatment facilities.
- Introduction to planning of regional hazardous waste management systems.
- Characteristics of individual waste types (dioxins, PCBs, heavy metals etc) and waste management in individual industries (steel, pulp and paper, petro chemical etc) by way of assignments and seminars

## HANDBOOK DESCRIPTION

See link to virtual handbook:

<https://www.handbook.unsw.edu.au/undergraduate/courses/2020/CVEN9881>

## OBJECTIVES

The objectives of the course include:

- Provide an appreciation of the management of hazardous waste in a systems context;
- Understand the inter-relationships between the various functional elements of waste generation, minimisation, transport, treatment and residue disposal. Provide students with the knowledge and skills to be able to undertake investigations and prepare concept designs of key elements of:
  - o Regional hazardous waste management systems including waste audits of industrial facilities
  - o Assessment of waste generation in a region
  - o Assessment of waste minimisation opportunities
  - o Outline designs of treatment and disposal facilities.

## TEACHING STRATEGIES

<b>Private Study</b>	<ul style="list-style-type: none"><li>• Review lecture material and course readings</li><li>• Contribute to group discussions and assessments</li><li>• Prepare for quiz/ workshops</li><li>• Download materials from Moodle</li><li>• Keep up with notices and find out marks via Moodle</li></ul>
<b>Lectures</b>	<ul style="list-style-type: none"><li>• Prepare for the lecture and workshops before attending</li><li>• Take notes from guest lectures</li><li>• Review recommended references on Moodle</li><li>• Hear announcements on course changes</li></ul>
<b>Workshops</b>	<ul style="list-style-type: none"><li>• Be active in workshops and group activities</li><li>• Participate in guest lecture / workshop activities</li><li>• Ask questions on assessment tasks</li></ul>
<b>Assessments</b>	<ul style="list-style-type: none"><li>• Demonstrate your knowledge and skills in assignments</li><li>• Demonstrate higher understanding and problem solving on real world problems and develop into sustainable solutions</li><li>• Demonstrate time management skills through group work and distribution of projects tasks</li><li>• Seek informal discussions via guest lectures and lecturers</li></ul>

## EXPECTED LEARNING OUTCOMES

At the completion of the course, you will be able:

<b>Learning Outcome</b>	<b>EA Stage 1 Competencies</b>
1. <i>To describe the basic principles underpinning the management of hazardous wastes including generation, minimisation, transport, treatment and residue disposal.</i>	PE1.1, PE1.5, PE 1.6
2. <i>To apply these principles for different hazardous waste types in an Australian context in general and NSW in particular.</i>	PE2.1, PE2.2, PE2.3, PE2.4
3. <i>To present the results and understanding in written and spoken formats</i>	PE3.2, PE3.4

**COURSE PROGRAM****Term 2 2020**

Date	Topic	Lecture Content	Demonstration Content
01/06/2020 (Week 1)	Introduction and background/ Classification of Hazardous Waste	Ailar Hajimohammadi	Introduction, assessment, assignment and rubric
08/06/2020 (Week 2)	Characterisation of Hazardous Waste	Ailar Hajimohammadi	Characterisation of Hazardous Waste
15/06/2020 (Week 3)	Basel convention and National Pollutant Inventory	Ailar Hajimohammadi	Basel convention and National Pollutant Inventory
22/06/2020 (Week 4)	Manifest Procedures, Prediction of Regional Hazardous Waste Quantities	Ailar Hajimohammadi	Manifest Procedures, Prediction of Regional Hazardous Waste Quantities
29/06/2020 (Week 5)	Cleaner Production and Waste Minimisation	Ademir Prata	Cleaner Production and Waste Minimisation
Break		<b><i>Flexibility week for all courses (non-teaching)</i></b>	
13/07/2020 (Week 7)	Integrated Off-site Hazardous Waste Treatment Facilities 1	Ademir Prata	Integrated Off-site Hazardous Waste Treatment Facilities 1
20/07/2020 (Week 8)	Integrated Off-site Hazardous Waste Treatment Facilities 2	Ademir Prata	Integrated Off-site Hazardous Waste Treatment Facilities 2
27/07/2020 (Week 9)	Scheduled Waste and Immobilisation	Ademir Prata	Schedule Waste and Immobilisation
03/08/2020 (Week 10)	Radioactive waste	Richard Collins	Radioactive waste

**ASSESSMENT**

Assessment Item	Description	Weight of final Grade	Max possible mark	Results Source (explained below)
Assignment	Research, analysis and discussion	30%	100	Moodle
Weekly Quizzes	Online quiz about last week lecture	25%	100	Moodle

Attendance to activities	Class and workshop activities	15%	100	In class/ Moodle
Participation in discussions	Participation in discussions and answering questions	0	5 Bonus marks	In class
Presentation	Video submission (screen capture recording)	30%	100	Moodle

Supplementary Examinations for Term 2 2020 will be held on Monday 7<sup>th</sup> September – Friday 11<sup>th</sup> September (inclusive) should you be required to sit one. You are required to be available during these dates. Please do not to make any personal or travel arrangements during this period.

<b>PENALTIES</b>
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*Late work will be penalised at the rate of 10% (of the total mark) per day after the due time and date have expired.*

**ASSESSMENT OVERVIEW**

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
1. Quizzes	10 min	25%	Understanding of each week lectures	Multiple choice questions. Assessment will be based on selecting the correct answer/s. The quizzes are directly related to the content previously taught in lectures and workshops.	Online (every week)	NA	Moodle
2. Assignment	30 pages maximum	30%	Group work, data research and collection, study, discussion and understanding	This is a group assignment. Students work in groups of 3 to provide a high-quality engineering report which includes legal, technical and economic considerations for the management of selected hazardous wastes and provide some recommendations. The aim is to demonstrate students capacity to work as a team, understand hazardous waste management at a regional level and provide recommendation to the Federal Government.	3 <sup>rd</sup> of August	9 <sup>th</sup> of August	Moodle
3. Class activities	10 min each	15%	Participation in lecture and workshop activities	In-class activities must be completed within 24 hours of relevant lecture and workshop.	Online (every week)	NA	Moodle
4. Presentation	10 min	30%	The ability to explain the learnings in few minutes	This is a 10 minutes presentation about students' understanding of the course. The level of understanding of hazardous waste management will be assessed. Also, students will demonstrate their time management, creativity, and presentation skills.	10 <sup>th</sup> of August	16 <sup>th</sup> of August	Moodle

***There will be 5 Bonus marks for three most active students who volunteer to answer questions during lectures, class activities and workshops.***

## RELEVANT RESOURCES

- Additional materials provided on Moodle.
- Recommended Internet sites.

## DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

<https://student.unsw.edu.au/dates>

## 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 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>

## Appendix A: Engineers Australia (EA) Competencies

### Stage 1 Competencies for Professional Engineers

	<b>Program Intended Learning Outcomes</b>
<b>PE1: Knowledge and Skill Base</b>	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
<b>PE2: Engineering Application Ability</b>	PE2.1 Application of established engineering methods to complex 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
<b>PE3: Professional and Personal Attributes</b>	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (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