School of Civil and Environmental Engineering

Term 3, 2020

CVEN3702 SOLID WASTE AND CONTAMINANT TRANSPORT

COURSE DETAILS		
Units of Credit	6	
Contact hours	6 hours per week	
Class	Wednesday, 13:00 – 15:00	Online
	Friday, 10:00 – 12:00	

Lecturer	Dr Ailar Hajimohammadi
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	office: CE308
Demonstrators	Soheil Heydari (Solid Waste)

- BIOS1301, CHEM1011, and CVEN2701 provide the biochemistry and chemistry to understand anaerobic digestion of organics in landfills, aerobic treatment of organics in composting, and partitioning of substances through physical, biological and chemical processes used in waste processing facilities.

- CVEN1701 enables students to take the components of waste management systems introduced in the course, and combine them in optimal ways to achieve the overall aims of regional waste management systems; it also introduces material accounting techniques of Life Cycle Assessment and Material Flux Analysis that can be used to analyse the environmental impact of waste processes, and be can used to optimize the design of facilities and waste management systems at corporate and regional level

- CEIC2009 is one of the most important preparatory courses, enabling students to undertake mass balances of goods and substances through waste processes such as material recovery facilities and

Contaminant transport component:

The capacity for analytical and critical thinking and for creative problem solving: You will be exposed to, and be required to solve, numerous and varied problems in the Lectures, the Exercises and the assignments - "the learning is in the doing". All these problems will cover a variety of scenarios, and where possible, will be drawn from engineering practice. You will be furnished with the Exercise solutions to all problems on Moodle so that you are able to check your analyses.

Solid Waste component:

The assignment will make up 20 of the 50 marks for the assessment for this component of the course, and you are required to work in a small group (of up to 3) for the Assignment. Refer to Moodle for group self-selection procedure. Briefing and data provision will be similar to that available in real world situations, and

	¶ Demonstrate higher understanding and problem solving on real world problems in a hypothetical region/context. ¶ Exams are summative assessments on knowledge gained in the course, particularly as indicated by the ability to quickly undertake exercises set in the Exercise problems.
Site visit (to be confirmed)	¶ Hands on work to set studies in context, to see operating problems with facilities in Sydney, with the aim of improving the conceptual design of waste facilities when you are a practicing engineer.
Email **MOODLE**	¶ You are strongly advised to check your UNSW emails daily for course related messages that are sent via News forum in Moodle. Use Q&A in Moodle to ask questions, as this builds an archive for all students in the course.

COURSE PROGRAM

A table of lectures and workshops or practical class topics for each week, indicating the name of lecturer involved (where multiple lecturers teaching in course), online activities, such as discussion forums, and relevant readings from textbook and other reference material identified for the course.

Term 3 2019

Date	Topic	Lecture Content	Demonstration Content
14/09/2020 (Week 1)	Introduction	Introduction and background	Introduction, and background, demo structures (and Assignments 1 and 2)
21/09/2020 (Week 2)	Waste minimisation, characterization	Waste minimisation and recovery, Waste characterization	Waste minimisation and Waste characterization
28/09/2020 (Week 3)	Waste transfer, Composting	Waste collection and transfer, Composting and MBT	Waste transfer, composting
05/10/2020 (Week 4)	Landfill gas, waste to energy	Landfill gas, waste to energy	MBT and waste to energy
12/10/2020 (Week 5)	Landfill waste and Landfill leachate	landfill waste disposal, landfill gas, Landfill leachate and leachate management,	landfill waste disposal & landfill gas, landfill leachate
19/10/2020 (Week 6)	Flexibility week for all courses (non-teaching)		
26/10/2020 (Week 7)	Processes of contaminant transport	Processes of transport, diffusion and decay (2hrs) Dispersion in laminar and turbulent flows (1hr) Guest Lecture from Dr. David Reynolds from Geosyntec (1hr)	Processes of transport, diffusion and decay Dispersion in laminar and turbulent flows
02/11/2020 (Week 8)	Jets, plumes and buoyant jets	Jets, plumes and buoyant jets	Jets, plumes and buoyant jets
09/11/2020 (Week 9)	Estuaries	Estuaries: classification and circulation	Estuaries: classification and circulation
16/11/2020 (Week 10)	Atmospheric dispersion	Atmospheric dispersion	Atmospheric dispersion
23/11/2020 (Week 11)			

ASSESSMENT

The final grade for this course will normally be based on the sum of the scores from each of the assessment tasks. The Final Examination is worth 60% of the Final Mark if class work is included and 100% if class work is not included. The class work is worth 40% of the Final Mark if included. *A mark of at least 40% in the final examination is required before the class work (hand-in quizzes and online tasks) is included in the final mark. The formal exam scripts will not be returned but you are permitted to view the marked script.*

Students who perform poorly in the quiz and workshops are recommended to discuss progress with the lecturer during the term. Note: The lecturer reserves the right to adjust the final scores by scaling if agreed by the Head of School.

Details of each assessment component, the marks assigned to it, the criteria by which marks will be assigned, and the dates of submission are set out below.

Supplementary Examinations for Term 3 2019 will be held on Monday 11th January to Friday 15th January 2021 (inclusive) should you be required to sit one. You a171(r)8(e)6.2 Tm0 g0W*n1 68.275 5l53(t)-21angogned(g)6(n2)90008

ASSESSMENT OVERVIEW

Item	**Length**	**Weighting**	**Learning outcomes assessed**	**Assessment Criteria** *(this needs to explicitly describe what students are expected to demonstrate in the task)*	**Due date and submission requirements**	**Deadline for absolute fail**	**Marks returned**
Assignment 1 Section (1)	Take Home	10	Conceptual design of a landfill	Assess the understanding of the concepts, data collection, calculations and reporting. Section 1 is the data gathering and calculations Will be explained in detail during demonstration	Section 1 Due date: Sunday 4th of Oct (11:59pm)	Section 1 Due date: Thursday 8th of Oct	Sunday 11th of Oct
Assignment 1 Section (2)	Take home	10	Conceptual design of a landfill	Assess the understanding of the concepts, data collection, calculations and reporting. Will be explained in detail during demonstration	Section 2 Due date: Sunday 18th Oct (11:59pm)	Sunday 25th of Oct	Sunday 1th of Nov
Bonus Marks on Assignment 1		An additional 5% of the total weighting of Assignment 1 will be awarded to students who actively participate.					

Assignment 2	Take home	15	Processes of contaminant transport. Dispersion and Diffusion. Jets, plumes and buoyant jets.	Assess the extent of contaminant transport, including operative governing jets, plumes and buoyant jets mechanisms.	Nov 12th	Nov 19th	Week 11
Final Exam	2 hours	[redacted]	Solid Waste Management				

RELEVANT RESOURCES

Contaminant Transport Component:

There is no textbook prescribed for this part of the course. The Lecture Notes are reasonably detailed and numerous references are cited within them. The main references are:

1. Ippen, A. T. (editor), *Estuary and Coastline Hydrodynamics, M*cGraw-Hill Company, Inc., New York, 1966, [UNSW Library – 1 copy]
2. Bowden, K. F., *Physical Oceanography of Coastal Waters*, John Wiley & Sons, Ellis Horwood Series in Marine Science, Chichester, 1983, ISBN 0 85312 686 0, [UNSW Library – 1 copy]
3. Lewis, R. *Dispersion in Estuaries and Coastal Waters*, John Wiley & Sons, Chichester, 1997, ISBN 0 471 96162 0, [UNSW Library – 1 copy]
4. Fischer, H. B., List, E. J., Koh, R. C. Y., Imberger, J. and Brooks, N., *Mixing in Inland and Coastal Waters*, Academic Press Inc., 1979, ISBN 0 12 258150 4, [UNSW Library – 1 copy]
5. Chapra, S. C., *Surface Water-Quality Modeling*, The McGraw-Hill Companies, Inc., New York, 1997, ISBN 0 07 115242 3, [UNSW Library – 1 copy]
6. Appelo, C.A.J., Postma, D., 2005. Geochemistry, Groundwater, and Pollution, 2nd Ed. A.A. Balkema, Rotterdam, 649 pp. ISBN 04 1536 428 0.
7. Fetter C.W., 2008. Contaminant Hydrogeology. 2nd Ed. Waveland Press. 500 pp. ISBN-13: 978-1577665830
8. Fetter C.W., 2008. Contaminant Hydrogeology. 2nd Ed. Waveland Press. 500 pp. ISBN-13: 978-1577665830

Waste Management Component:

There is no textbook prescribed for this part of the course too. The Lecture Notes are reasonably detailed, and demonstrations will have good examples. The main references are:

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;
- ¶ General and Program-specific questions: The Nucl

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers