Course Outline (Higher Education)

School:	School of Health and Life Sciences
Course Title:	WASTE MANAGEMENT AND REMEDIATION
Course ID:	ENVGC3761
Credit Points:	15.00
Prerequisite(s):	(CHMGC1022 and CHMGC2752)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED Code:	050999

Description of the Course :

Waste Management and Remediation is a third level course which investigates the management of waste and remediation processes. The course includes: establishment of a waste reduction and waste-to-resource culture; sustainable waste management in the context of greenhouse gas emissions and renewable energy generation; use of CO_2 as a feedstock and its long term storage options; solid waste disposal and recycling (municipal, C&I, C&D); landfill management; microbiological (aerobic and anaerobic) and chemical/physical remediation techniques for recalcitrant organic compounds such as petrochemicals in soils and aquifers.

Grade Scheme: Graded (HD, D, C, etc.)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks..

Program Level:

AQF Level of Program					
5	**6**	**7**	**8**	**9**	**10**
Level					
Introductory					
Intermediate					
Advanced		✔			

Learning Outcomes:

Knowledge:

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K1. Demonstrate an understanding of the principles of the waste hierarchy and towards zero waste strategies.

K2. Explain the need for an integrated, sustainable waste management plan in industrial processes and be able to relate to this within the context of existing laws and regulations.

K3. Describe Greenhouse Gas emission reduction challenges including CO_2 transport and storage.

K4. Demonstrate an understanding of basic biological, physical and chemical principles behind waste and water treatment and management technologies.

K5. Identify, through innovative thinking, sensible solutions to wastes on the basis of tried or potential remediation / management strategies.

K6. Identify areas within an industrial process that may be improved upon in order to achieve reduced environmental management costs through waste minimisation, recycling, greater materials efficiencies, process or operational optimisation.

Skills:

S1. Evaluate and utilise the waste hierarchy and zero waste principals to reduce the amount of waste generated by industry and the general population.

S2. Identify practicable solutions for waste disposal and long term containment.

S3. Critically evaluate scientific data.

Application of knowledge and skills:

A1. Reflect on the issues associated with CO_2 conversion into other products and its long term storage and be able to recommend practicable strategies for CO_2 mitigation.

A2. Formulate and evaluate waste mitigation strategies.

A3. Apply existing technology to ameliorate pollution problems.

Course Content:

This course covers solid, liquid and gaseous waste management and remediation and the technologies and science involved.

Topics may include:

- Introduction to waste management and remediation.
- Introduction to environmental microbiology.
- Solid waste management.
- Landfills and the regulations governing them.
- Biogeochemical cycles.
- Waste water and anaerobic digestion.
- Acid mine drainage.
- Carbon dioxide - its conversion and long term containment and storage.
- Composting.
- Bioremediation.

Values:

V1. To develop an environmentally responsible attitude towards waste management and remediation.

Graduate Attributes:

FedUni graduate attributes statement. To have graduates with knowledge, skills and competence that enable them to stand out as critical, creative and enquiring learners who are capable, flexible and work ready, and responsible, ethical and engaged citizens.

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Attribute	Brief Description	Focus
Knowledge, skills and competence	Skills to find and interpret information independently.	Medium
Critical, creative and enquiring learners	Independent learning and presentation to class.	High
Capable, flexible and work ready	Real case studies of industrial and municipal waste issues.	Low
Responsible, ethical and engaged citizens	Understanding of the impact of waste on society now and into the future.	High

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K6, S1-S3, A1-A3	Research assignment of issues in waste management and remediation.	Written "conference" paper and presentation to class.	10-20%
S2, K6	Live debate on an allocated waste topic.	Presentation and debate.	10-20%
S1-S3, any of K1-K6, A1-A3	Case study of real world waste issue.	Written "conference" paper and presentation to class.	10-20%
A1-A2, K1-K6, S1-S2	Written 3 hour exam paper.	Examination.	40-60%

Adopted Reference Style:

Australian