

Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Water and Wastewater System

Unit ID: ENGRG2103

Credit Points: 15.00

Prerequisite(s): (ENGRG1002)

Co-requisite(s): Nil

Exclusion(s): (ENGIN3206)

ASCED: 030999

Description of the Unit:

The primary goals of this unit are to cultivate knowledge & skills for water and wastewater treatment systems. The unit commences by elucidating the importance of water and wastewater treatment in conjunction with hydrology and hydraulics. It will then delve into water quality parameters to establish the necessity for treatment of both water and wastewater and effects of limited or inadequate treatment. Following this, the unit provides details of treatment processes, encompassing physical, chemical, and biological aspects, along with principles and methodologies for designing unit processes. The unit will conclude by addressing principles of waste management.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

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 Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

On successful completion of the unit the students are expected to be able to:

Knowledge:

- K1.** Describe differences between different types of water and wastewaters.
- K2.** Describe the processes involved in the water and wastewater treatment.

Skills:

- S1.** Analyse problems and design in water and wastewater treatment and design the major components of treatment systems.
- S2.** Laboratory experiments to calculate optimum chemical dosage in jar test experiments and to evaluate filter`s hydraulic and treatment performances.
- S3.** Design unit processes for water and wastewater treatment.

Application of knowledge and skills:

- A1.** Calculate the water demand of communities; variation in demand and prediction of future requirements.
- A2.** Applying concepts and understanding of water and wastewater treatment to water resources management.
- A3.** Estimating wastewater outputs and characteristics of communities and other organisations.
- A4.** Design water supply treatment facilities and wastewater treatment facilities.
- A5.** Apply concepts of sustainability and water conservation in the creation of water and wastewater treatment and management facilities.

Unit Content:

Topics may include:

- Need and role of water and wastewater treatment in water resources management
- Different water quality parameters used to monitor quality
- Various water and wastewater systems in an urban environment
- Functions and modes of operation of urban water and wastewater systems and processes
- Examination of the water supply system, stormwater management system, sewerage system and the interface between these systems

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K2, S1-S3, A1-A5	Field and/or plant visits to understand water management in industry.	Assessment and/or presentation	10% - 30%
K1-K2, S1-S3, A1-A5	A combination of problem based assignments and laboratory experiments.	Reports	10% - 30%
K1-K2, S1-S3, A1-A5	Test(s) on any or all material covered in the unit.	Test	40% - 60%

Adopted Reference Style:

IEEE

Refer to the [library website](#) for more information

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