

Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	WATER AND WASTEWATER
Course ID:	ENGIN3206
Credit Points:	15.00
Prerequisite(s):	(ENCIV2320 or ENGIN2201)
Co-requisite(s):	Nil
Exclusion(s):	(ENCIV3320)
ASCED:	030909

Description of the Course :

The main objectives of the unit are to develop the knowledge & understanding, skills and attitudes associated with water and wastewater treatment systems in urban environments. To meet these objectives, there are a number of sub-objectives that need to be addressed. These are:

1. To understand elements of urban water and wastewater management systems -their functions, modes of operation, and design standards,
2. To acquire necessary skills to undertake engineering investigation and design of each of these elements, and
3. To acquire necessary skills to integrate them to form urban water and wastewater infrastructure to facilitate sustainable urban catchment development and water resource utilization.

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:

Level of course in Program	AQF Level of Program					
	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"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

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

Knowledge:

- K1.** Explain the concepts of sustainability as applied to waste and water management engineering
- K2.** Describe differences between different types of water and wastewaters
- K3.** Familiarise with parameters and methods used to define water quality
- K4.** Describe the characteristics of water and wastewater and explain the processes involved in the water and wastewater treatment

Skills:

- S1.** Calculate the wastewater outputs of communities and other organisations
- S2.** Analyse problems in water and wastewater treatment and design the major components of treatment systems
- S3.** Laboratory experiments to calculate optimum chemical dosage in jar test experiments and to evaluate filter`s hydraulic and treatment performances
- S4.** Design unit processes for water and wastewater treatment

Application of knowledge and skills:

- A1.** Estimating wastewater outputs and characteristics of communities and other organisations
- A2.** Design water supply treatment facilities and wastewater treatment facilities
- A3.** Apply concepts of sustainability and water conservation in the creation of water and wastewater treatment and management facilities.
- A4.** Apply concepts of efficiency and better water management

Course Content:

Topics may include:

- Various water and wastewater systems in an urban environment
- Functions and modes of operation of urban water and wastewater systems and processes
- Influence of climate variability on urban requirements in terms of supply of potable water and disposal of wastewater
- Examination of the water supply system, stormwater management system, sewerage system and the interface between these systems.

- Different water quality parameters used to monitor quality

Values:

- V1.** Appreciate the value of effective wastewater management in modern society
- V2.** Appreciate the various processes and steps of water and wastewater treatment operations
- V3.** Appreciate that while engineering design is a creative process, rigorous analysis is essential in order to achieve a high quality and optimal solution
- V4.** Appreciate the importance of safety, environmental and community considerations in design of water treatment and waste management systems
- V5.** Develop professional interaction skills through appropriate field visits and reporting

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K4, S1-S4, A1-A4	A	3	A
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K1-K4, S1-S4, A1-A4	B	2	B
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K1-K4, S1-S4, A1-A4	B	1, 2	B
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1-K4, S1-S4, A1-A4	B	1, 2	B

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K4, S1-S4, A1-A4	Field and/or plant visits to understand water management in industry.	Group assessment and/or presentation.	15 - 30%
K1-K4, S1-S4, A1-A4	A combination of problem based assignments and laboratory experiments.	Individual reports.	15 - 30%
K1-K4, S1-S4, A1-A4	An examination on any or all material covered in the course.	Examination	40 - 60 %

Adopted Reference Style:

Other (IEEE: Refer to the library website for more information)