COURSE OUTLINE

CIV304 Water and Wastewater

School: School of Science, Technology and Engineering

2026 | Trimester 2

UniSC Sunshine Coast
UniSC Moreton Bay

BLENDED LEARNING

Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

This course develops knowledge, skills and attitudes associated with water and wastewater treatment systems in urban environments. To meet these objectives, you will 1) develop specific knowledge on elements of urban water and wastewater management systems, their functions, modes of operation, and design standards, 2) acquire skills to undertake engineering investigation and design of each of these elements, and 3) integrate them in the design of urban water and wastewater infrastructure to facilitate sustainable urban catchment development and water resource utilization.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous weekly learning material	1hr	Week 1	12 times
Seminar – On campus	1hr	Week 1	3 times
Tutorial/Workshop 1 – On campus	2hrs	Week 1	10 times
Laboratory 1 – On campus	2hrs	Week 2	5 times

1.3. Course Topics

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

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth full-time study year of an undergraduate program.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Competencies from multiple Professional Bodies (see below) *
1 Identify parameters and methods used to define water quality	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
2 Describe the characteristics of water and wastewater and explain the processes involved in water and wastewater treatment.	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
3 Synthesize optimal solutions for unit processes of water and wastewater treatment.	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.1, 2.1
4 Apply concepts of efficiency and better water management to urban water and wastewater management scenarios.	Creative and critical thinker Sustainability-focussed	2, 2, 2.1.h, 2.1.h, 2.1, 2.1
5 Perform laboratory experiments to calculate pump curves and evaluate water quality and treatment methods.	Empowered	2, 2, 2.2.h, 2.2.h, 2.2, 2.2
6 Apply key concepts of sustainability and water conservation in the creation of water and wastewater treatment and management facilities.	Sustainability-focussed	1, 1, 1.6.c, 1.6.c, 1.6, 1.6

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the technology domain: Proficiently applies advanced technical knowledge and skills to deliver engineering outcomes in specialist area(s) of the technology domain and associated industry, commercial and community sectors.
1.6.c	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain: Appreciates the social, environmental and economic principles of sustainable engineering practice.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the technology domain.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain.
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.1.h	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Identifies, quantifies, mitigates and manages technical, health, environmental, safety and other contextual risks associated with engineering application in the technology domain.

CODE	COMPETENCY
2.2.h	Engineering Application Ability - Application of engineering techniques, tools and resources within the technology domain: Safely applies laboratory, test and experimental procedures appropriate to the technology domain.
2.1	Engineering Application Ability: Application of established engineering methods to broadly-defined problem solving within the technology domain.
2.2	Engineering Application Ability: Application of engineering techniques, tools and resources within the technology domain.
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the engineering discipline: Proficiently applies advanced technical knowledge and skills in at least one specialist practice domain of the engineering discipline.
1.6.c	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline: Appreciates the social, environmental and economic principles of sustainable engineering practice.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the engineering discipline.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.1.h	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Identifies, quantifies, mitigates and manages technical, health, environmental, safety and other contextual risks associated with engineering application in the designated engineering discipline.
2.2.h	Engineering Application Ability - Fluent application of engineering techniques, tools and resources: Safely applies laboratory, test and experimental procedures appropriate to the engineering discipline.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.2	Engineering Application Ability: Fluent application of engineering techniques, tools and resources.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

CIV202 or MEC200 or ENG211

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

CIV400

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

In all tutorials, throughout trimester, students will be asked to complete sample quiz questions assessment tasks. Feedback will be given to students throughout the trimester.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Oral and Written Piece	Group	40%	2000 word report + 10 minute presentation	Week 6	Online Assignment Submission with plagiarism check
All	2	Artefact - Professional	Individual	30%	2000 words	Week 12	Online Assignment Submission with plagiarism check
All	3	Quiz/zes	Individual	30%	1 hour per quiz	Refer to Format	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Planning Stage Design of a Water and Sewer Network

GOAL:	Planning Stage Design of a Water and Sewer Network
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Written planning level assessment and design report with adherence to the design recommendations of the relevant codes and standards. Present your findings and design in a 10 minute presentation.
CRITERIA:	

No.		Learning Outcome assessed
1	Identification of parameters and methods used to define water quality	1
2	Description of the characteristics of water and wastewater and explanation of the processes involved in water and wastewater treatment.	2
3	Application of key concepts of sustainability and water conservation in the creation of water and wastewater treatment and management facilities.	6

GENERIC SKILLS:	Communication, Collaboration, Problem solving, Organisation

All - Assessment Task 2: Hydraulic and Treatment Capacity Assessment and Upgrade Recommendations for a Wastewater Treatment Plant

GOAL:	Assess the hydraulic and treatment capacity of an existing wastewater treatment plant to identify limitations for a future upgrade. Recommend changes to address these limitations
PRODUCT:	Artefact - Professional
AUTHORSHIP STATEMENT:	
FORMAT:	Professional report

CRITERIA:

No.		Learning Outcome assessed
1	Identification of parameters and methods used to define water quality	1
2	Perform laboratory experiments to calculate optimum chemical dosage in jar test experiments and to evaluate filter`s hydraulic and treatment performances.	5

GENERIC SKILLS:	Problem solving, Organisation, Applying technologies, Information literacy

All - Assessment Task 3: Quizzes

GOAL:	Demonstrate understanding of any or all materials covered in the course.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	An examination on any or all materials covered in the course. Quiz 1 will be in Week 7 and Quiz 2 in Week 12.

CRITERIA:

No.		Learning Outcome assessed
1	Identification of parameters and methods used to define water quality	1
2	Description of the characteristics of water and wastewater and explanation of the processes involved in water and wastewater treatment.	2
3	Synthesis of optimal solutions for unit processes of water and wastewater treatment.	3
4	Application of concepts of efficiency and better water management to urban water and wastewater management scenarios.	4
5	Application of key concepts of sustainability and water conservation in the creation of water and wastewater treatment and management facilities.	6
6	Recall laboratory experiments to calculate pump curves and evaluate water quality and treatment methods.	5

GENERIC SKILLS:	Problem solving, Information literacy

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Required	Metcalf & Eddy Inc.	2013	Wastewater Engineering	5	McGraw-Hill Higher Education

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central