

AU Course Outline Template

College of Engineering

Civil Engineering Department

CIVL450 – Water and Environmental Engineering

CIVL22

Bachelor of Engineering Technology - Civil

- Prerequisites: CIVL350
- Co-Requisites: None
- Credit Hours: 3 credits
- Course Coordinator:
- Instructor's Information:
- Classroom Location and timings¹:

This course is part of the mentioned above program which is accredited by Engineers Australia.

Catalog Description

The course provides a broad overview of water and environmental engineering measurements, chemistry, biology, and physics. The course covers variety of selected environmental topics such as, but not limited to, air, land, and water pollution, hydrological cycle components, runoff generation, stormwater management, water treatment processes, sustainability, and global hydrological and environmental challenges.

Course Objectives and Student Learning Outcomes

- LO1** Understand the fundamental concepts of Earth system science and sustainable development
- LO2** Apply the principles of hydrology, environmental engineering, and sustainability for water security under global warming and climate change
- LO3** Analyse water security by assessing hydrological processes, environmental flow, water quality parameters, and drinking water distribution systems
- LO4** Evaluate the availability, quality, and accessibility of drinking water based on its drainage, pollution, treatment processes, requirements, and supply

¹ Classroom timings and location are tentative, please refer to ATS for the up-to-date information.

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- LO5** Develop adaptation and mitigation strategies or interventions, like nature-based solutions, for acting towards achieving water security
- LO6** Formulate the role of water and environmental engineering in global sustainability

Engineers Australia Stage 1 Competencies

Achieving the student learning outcomes of this course partially fulfills the following EA Stage 1 Competencies for Engineering Technologists.

Knowledge and Skills	1.1 Systematic, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the technology domain.
	1.2 Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the technology domain.
	1.3 In-depth understanding of specialist bodies of knowledge within the technology domain.
	1.4 Discernment of knowledge development within the technology domain.
	1.5 Knowledge of engineering design practice and contextual factors impacting the technology domain.
	1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain.
Engineering Application Ability	2.1 Application of established engineering methods to broadly-defined problem solving within the technology domain.
	2.2 Application of engineering techniques, tools and resources within the technology domain.
	2.3 Application of systematic synthesis and design processes within the technology domain.
	2.4 Application of systematic approaches to the conduct and management of projects within the technology domain.
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.
	3.2 Effective oral and written communication in professional and lay domains.

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	3.3 Creative, innovative and pro-active demeanor.
	3.4 Professional use and management of information.
	3.5 Orderly management of self, and professional conduct.
	3.6 Effective team membership and team leadership.

Course Content

The course material will be delivered to the student as a mix of power point presentation, handwritten notes and handouts. Below are the topics that will be covered during this course. Please note that topics are tentative to change.

#	Topic	Resources	Learning Outcomes /Performance Criteria
1	Fundamentals of Earth System Science	PPT, Book 1 (Ch 8)	LO-1
2	Environmental Chemistry	PPT, Book 1 (Ch 2)	LO-1, 2
3	Environmental Risk Assessment	PPT, Book 1 (Ch 4)	LO-1, 2
4	Water Pollution	PPT, Book 1 (Ch 5)	LO-2, 3
5	Principles of Hydrology	PPT, Book 2 (Ch 7, 8, 9, 10)	LO-2, 3, 4
6	Water Withdrawal, Use, and Distribution	PPT, Book 2 (Ch 11, 12)	LO-2, 3, 4
7	Urban Drainage	PPT, Book 2 (Ch 15, 16)	LO-3, 4
8	Water Resources Management for Sustainability	PPT, Book 2 (Ch 19)	LO-3, 4, 5
9	Water Treatment Processes	PPT, Book 3	LO-3, 4, 5

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10	Drinking Water Distribution Systems	PPT, Book 2 (Ch 12, 15, 16)	LO-4, 5, 6
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Methods of Delivery

This course will be delivered on-campus face to face delivery method. Students are expected to attend designated live lectures on campus. Any updates about the method of delivery will be communicated with the students via the official communication platforms.

Extent and Nature of Use of Technology

All the lectures' slides and other learning material for this course are available online on the course webpage on EduLearn. Students are required to visit this page regularly to check for any update. Course related announcements are sent by email. Students are required to check their email daily.

Textbook/s

For this course, the following textbook will be used:

1. Introduction to Environmental Engineering and Science: Pearson New International Edition, 3/E 2014.
2. Water Resources Engineering. 3rd Edition, Larry w. Mays, 2019. Wiley, ISBN-10: 111949057x.
3. Water and Wastewater Engineering: Design Principles and Practice, Mackenzie Davis, McGraw-Hill Education, 2010, Professional Edition, ISBN: 978-0-07-171385-6.

Additional Supplemental Materials

N/A

Attendance

The student is required to attend designated live session on campus. A student who fails to do so will be marked as absent from that class.

Please refer to the AU Student Attendance Policy and Procedure on the [AU portal](#).

Submission of Work

Please refer to the AU Code of Academic Integrity on the [AU Portal](#).

Assessment Plan

The assessments dates are subject to change according to the material coverage pace.

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#	Assessment Title	Method of Assessment	Learning Outcomes Covered	Week	Weight
1	Midterm	Written Exam		Midterm Exams Period	25%
2	Continuous Assessment*	Quizzes & Assignment		TBA	25%
3	Attendance/Participation	In Class Participation/Attendance		1-14	10%
4	Final Exam	Written Exam		Final Exam Period	40%

*Assignments will be followed by group presentations delivered by the students. Late submissions will be penalized by 25% mark deduction up to three-day late.

* A student who misses an in-class assessment (quiz, in-class group work, in-class assignment, etc.) of a weight of 10% or less will not be eligible for makeup and will be automatically awarded a zero mark.

Students must refer to the AU Student Assessment Policy on the [AU Portal](#) with regards to assessments and re-assessment.

Grading Scale

Please refer to the AU Grading Policy on the [AU Portal](#).