



Course Descriptor

ENEN582 Desalination Engineering

Proposed Academic Year	2020/2021	Last Reviewed Academic Year	2019/2020
Course Code	ENEN582	Course Title	Desalination Engineering
Credit hours	3	Level of study	Forth
College / Centre	College of Engineering	Department	Environmental Engineering
Co-requisites		Pre-requisites	CVEN552

1. COURSE OUTLINE

The course goals to improve the understanding of the underlying basic governing principles of desalination technologies design and operation. The course topics include raw water quality, membrane processes (reverse osmosis, electrodialysis) design and operation, evaporative processes (multi-stage flash and multiple effect)

2. AIMS

The course provides students with concepts and techniques that enable them to understand the desalination technologies design and operation.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS (Indicative)

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
1. Understand the chemical reactions and kinetics which related to the environment	Lectures	Assignments and in-class tests
2. Understand the concepts of chemical kinetics	Lectures	Assignments and in-class tests
3. Ability to analyze continuous the environmental issues from chemistry approach	Lectures	Assignments and in-class tests

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Assignments	20%
Mid-term Examinations (two)	40%
Final Examination	40%
TOTAL	100%

5. ACHIEVING A PASS

Students will achieve **3** credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%**.

NB *Ensure that ALL learning outcomes are taken into account



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LECTURE TOPIC	TIME (HOURS)
Introduction to desalination	6
desalination technologies design	3
Membrane processes	6
Reverse osmosis	6
Evaporative processes (multi-stage flash and multiple effect),	6
Electrodialysis	3
Fouling and pre-treatment	3
Calculation of membrane design and operational parameters	6
Desalination water quality	3
Cost of desalination	3
TOTAL HOURS	45
Plus RECOMMENDED INDEPENDENT STUDY HOURS	
TOTAL COURSE HOURS	45

7. RECOMMENDED READING

Core text/s:

Desalination Engineering: Planning and design 1st Edition, By Nikolay Voutchkov

Library + online resources:

<https://www.oercommons.org/courses/water-desalination-plant/view>

<https://www.oercommons.org/courses/ocean-water-desalination/view>

<https://www.oercommons.org/courses/desalination-and-water-purification-spring-2009/view>