



Course Descriptor

ENEN431 Water and Wastewater Treatment

Proposed Academic Year	2020-2021	Last Reviewed Academic Year	Fall 2020
Course Code	ENEN431	Course Title	Water and Wastewater Treatment
Credit hours	3	Level of study	4 th Year
College / Centre	COE	Department	Civil and Environmental
Co-requisites	None	Pre-requisites	None

1. COURSE OUTLINE

The course provides students with basic tools for water and wastewater treatment techniques and properties such as process kinetics, coagulation, flocculation, sedimentation, activated sludge, trickling filters, rotating biological contactors, filtration, disinfection, ion exchange, air stripping, electro-dialysis and reverse osmosis

2. AIMS

The course provides students with concepts and techniques that enable to understand the wastewater treatment techniques and to understand the water important properties.

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

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
1. Understand the critical issues related to planning, design, and operation water and wastewater treatment facilities	Lectures	Assignments and in-class tests
2. Ability to describe the main components of water and wastewater treatment system	Lectures and Lab experiments	Assignments and in-class tests
3. Understand the basic water and wastewater quality parameter	Lectures and Lab experiments	Assignments and in-class tests

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Assignments	10%
Lab reports	10%
Quizzes	0%
First Mid-term	20%
Second Mid-term	20%
Final Examination	40%



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TOTAL	100%
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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

6. COURSE CONTENT (Indicative)

Introduction to Water Quality, Water, and Wastewater Treatment	
Lab orientation	
Definition of physical, chemical and biological water parameters	
Coagulation and flocculation	
Experiment (1) Measurement of water pH and conductivity	
Sedimentation	
Experiment (2) Measurement of wastewater Odor	
Experiment (3) Measurement of Chlorine and Hardiness	
Activated sludge and trickling filters	
Experiment (4) Using of spectrophotometer for measuring turbidity	
Rotating biological contactors and filtration	
Disinfection, ion exchange and air stripping	
Electro-dialysis and reverse osmosis	
TOTAL HOURS	45
Plus RECOMMENDED INDEPENDENT STUDY HOURS	90
TOTAL COURSE HOURS	135

7. RECOMMENDED READING

Core text/s:

Davis, M. (2010). *Water and Wastewater Engineering* 1st Edition, McGraw-Hill, NY.

Library + Online resources:

Hopcroft, F. (2014). *Wastewater Treatment Concepts and Practices*, Momentum Press Engineering, <https://eds.b.ebscohost.com/eds/ebookviewer/ebook?sid=534caffd-2e0f-44ed-9f9b-b45666d5de9b%40sessionmgr101&vid=0&format=EK>

Lydia, B. (2014). *Wastewater Treatment: Processes, Management Strategies and Environmental/health Impacts*. Nova Science Publisher, Inc. NY.
<https://www.masader.om/eds/detail?db=e000xww&an=1020634&isbn=9781634824910>