Jordan University of Science and Technology

Faculty of Engineering

Civil Engineering Department

CE452 Environmental Engineering - JNQF Level: 7
First Semester 2023-2024

Course Catalog
3 Credit Hours. 3 Credit hours (3 h lectures). Application of scientific and engineering principles to an understanding of environmental issues associated with human activity. Mass and energy transfer, environmental chemistry, water and air pollution, pollutant transport modeling, pollution management, and risk assessment, and global atmospheric change. Introduction to the physical, chemical, and biological systems relating to the quality of water, land and air.

Text Book	
Title	Introduction to Environmental Engineering and Science, 3nd Edition, Gilbert M. Masters, Prentice Hall, NJ
Author(s)	Gilbert M. Masters
Edition	3rd Edition
Short Name	Masters
Other Information	

Instructor	
Name	**Prof. Ziad Al-Ghazawi**
Office Location	C2 L3
Office Hours	Sun : 11:30 - 13:30 Mon : 10:30 - 11:15 Tue : 11:30 - 12:30 Wed : 12:30 - 15:00
Email	gziad@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue : 10:30 - 11:30
Room: C2008

Section 2:
Lecture Time: Mon, Wed : 11:30 - 12:30
Room: C3016

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
233520	CE352 Hydraulics	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction, Historical background National and International Environmental Law Legislation and Regulation	
Week 2	Units of Measure Mass Transfer (materials balance, flow models) Reaction Kinetics	
Week 3	Mass Transfer / Reactors Environmental Chemistry (stoichiometry, Enthalpy in chemical systems, chemical equilibria, pH, solubility) Text book : Chapter 2	
Week 4	Mathematics of Growth Resource consumption, Population Growth	
Week 5	Water Quality Water Resources (Surface and Ground water) Water Pollutants Biochemical Oxygen Demand, Nitrogen oxidation	
Week 6	Water Quality Water Resources (Surface and Ground water) Water Pollutants Biochemical Oxygen Demand, Nitrogen oxidation	
Weeks 7, 8	DO sag curve, Effect of oxygen demanding wastes on rivers. Water quality in lakes and reservoirs (Stratification and turnover)	
Weeks 9, 10, 11	Drinking Water Treatment/Coagulation and Flocculation, Sedimentation/Filtration /Disinfection	
Week 12	Softening / Ion exchange (Hardness and Alkalinity)	
Weeks 13, 14, 15	Air Pollution Overview Criteria Pollutants , stationary sources, Air Pollution Meteorology The point source Gaussian plume model Indoor air quality	
Week 16	Noise Pollution	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Students should be able to demonstrate the building blocks of environmental analysis, chemistry, kinetics, and modeling of systems. [1L7S2]	20%	

Students should be able to differentiate between law, regulations, and standards; and Students should be able to describe enforcement mechanisms for environmental law [1L7C2]	10%	
Students should be able to apply the environmental engineering solutions in, economic, ethical, and societal context [1L7S1]	10%	
Students should be able to evaluate contaminates in water, air, and solid waste; and Students should be able to evaluate pollution control strategies [1L7S2]	15%	
Students should be able to practice basic environmental engineering to design water treatment plants and to comprehend quality issues in distribution system and storage facilities [1L7C4]	45%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7

Relationship to NQF Outcomes (Out of 100%)			
L7S1	L7S2	L7C2	L7C4
10	35	10	45

Evaluation	
Assessment Tool	**Weight**
Final Exam	40%
First Exam	25%
Second Exam	25%

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