

COURSE SYLLABUS – ChE 465

COURSE TITLE	ENGLISH CODE/NO	ARABIC CODE/NO	CREDITS				
			Th.	Pr.	Tr.	Tu.	Total
Industrial Pollution Control	ChE 465	٤٦٥ هكـ	3	--	--	1	3
Pre-requisites:	ChE 321, ChE 334						
Course Role in Curriculum	<i>Required or Elective:</i>		Elective				
	<i>A pre-requisite for:</i>		--				
Catalogue Description: Sources of pollution from chemical industries. Standards and legalization. Health and environmental effects of pollution. Air pollutants; particulate, SO _x , NO _x , and organic vapors. Air pollution control. Treatment of industrial wastewater. Handling of solid waste. Monitoring of pollutants. Case studies for specific industries like petrochemicals, fertilizers, desalination and petroleum refining.							

<u>Textbooks:</u> Howard S. Peavy, Donald R. Rove and George Tchobanoglous, ENVIRONMENTAL ENGINEERING, 4 th edition, McGraw-Hill, 2007
<u>Supplemental Materials:</u> Ref.: Metcalf and Eddy, Waste Water Engineering (Treatment, Disposal, and Reuse), 3 rd ed. McGraw-Hill, 2005

Course Learning Outcomes:

By the completion of the course the student should be able to:

1.	Define the impact of humans upon the environment and the role of the environmental engineer.
2.	Analyze mass balance of various environmental systems.
3.	Define the physical, chemical, and biological water quality parameters.
4.	Describe basic laboratory measurements, such as BOD, TSS; as stated in <i>standard Methods</i> .
5.	Analyze various unit Operations and unit processes used in wastewater treatment.
6.	Evaluate process design criteria for different hazardous waste treatment technologies.
7.	Outline the air quality parameters.
8.	Analyze various particulate and gaseous pollutant removal mechanisms including gravitational settling chambers, wet and cyclonic scrubbers, electrostatic precipitators, fabric filters, adsorption beds and absorption towers.
9.	Classify various solid and hazardous waste management methods including leachate characterization.
10.	Prepare a term project analyzing a case study or a treatment process in hazardous waste.

<u>Topics to be Covered:</u>		<u>Duration in Weeks</u>
1.	Introduction	1
2.	Water pollution control technologies	3
3.	Design of simple water treatment system	3
4.	Air pollution control technologies	3
5.	Solid and hazardous wastes	2
6.	Case studies for specific industries	2

Key Student Outcomes addressed by the course: (Put a √ sign)

(a) an ability to apply knowledge of mathematics, science, and engineering	
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	√
(d) an ability to function on multidisciplinary teams	
(e) an ability to identify, formulate, and solve engineering problems	√
(f) an understanding of professional and ethical responsibility	
(g) an ability to communicate effectively	
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i) a recognition of the need for, and an ability to engage in life-long learning	
(j) a knowledge of contemporary issues	√
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Instructor:	Dr. Gaber Edris
Last updated :	January 2015