

COURSE INFORMATION					
Course Title	Code	Semester	L+P Hour	Credits	ECTS
Pollution and Control	CHBE 552		3 + 0	3	10

Prerequisites	-
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Language of Instruction	English
Course Level	Graduate Degree
Course Type	Technical Elective
Course Coordinator	
Instructors	
Assistants	
Goals	The aim of this course is to provide students with an advanced knowledge of environmental pollution, and methods of combatting pollution
Content	Definition and criteria of pollution, air pollution, water pollution, soil pollution, types of pollution control, physical/chemical methods, biological methods

Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Ability to define basic principles of pollution	1,8	1,2	A
2) Ability to use theoretical and applied information solve engineering problems on pollution	2,8	1,2	A,D

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Discussion, 9: Simulation, 12: Case Study
Assessment Methods:	A: Testing, B: Experiment, C: Homework, D: Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Introduction to Pollution (<i>Basic concepts,</i>)	Textbook- Lecture Notes

2	Types of Wastes, classification	Textbook- Lecture Notes
3	Air pollution, sources, methods of prevention	Textbook- Lecture Notes
4	Air pollution, sources, methods of prevention	Textbook- Lecture Notes
5	Water pollution, sources, methods of prevention	Textbook- Lecture Notes
6	Water pollution, sources, methods of prevention	Textbook- Lecture Notes
7	MIDTERM EXAM I	Textbook- Lecture Notes
8	Soil pollution, sources, methods of prevention	Textbook- Lecture Notes
9	Soil pollution, sources, methods of prevention	Textbook- Lecture Notes
10	Waste Treatment methods	Textbook- Lecture Notes
11	Chemical/Physical Methods	Textbook- Lecture Notes
12	Biological Methods	Textbook- Lecture Notes
13	Secondary/Tertiary Treatment/ Special Methods	Textbook- Lecture Notes
14	Project presentations	-

RECOMMENDED SOURCES

Textbook	"Wastewater Engineering, Treatment and Reuse", 4th Edition ,Metcalf &Eddy,Inc.,Revised by G.Tchobanoglous, F.Burton, H.D.Stensel, McGraw Hill, 2003
Additional Resources	

MATERIAL SHARING

Documents	
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Assignments	
Exams	

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-terms	1	64
Project	1	36
Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		45
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		55
Total		100

COURSE CATEGORY	Expertise/Field Courses
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COURSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Acquire expanded and in-depth information via performing scientific research in the field of Chemical Engineering, evaluate, interpret and implement knowledge.					X
2	Be knowledgeable in the contemporary techniques and methods applied in Chemical Engineering and their respective constraints.					X
3	Be cognizant of the novel and developing applications of his/her profession, study and learn them as required.					
4	Formulate Chemical Engineering problems, develop methods to solve them and implement innovative techniques in solutions					
5	Design and conduct analytical modeling and experimental research, analyze and interpret complex problems encountered in this process.					
6	Develop novel and/or original ideas and methods; conceive innovative solutions in systems, component and process design					
7	Complete information via processing limited or incomplete data by the use of scientific methods and implement it; integrate knowledge from different disciplines					
8	Communicate in at least one foreign language at the level of European Language Portfolio B2 orally and in writing.					X
9	Communicate stages and results of his/her studies in a systematic and clear manner orally or in writing in intra or interdisciplinary national and international settings.					
10	Defines societal and environmental aspects of Chemical Engineering applications					
11	Observe social, scientific and ethical values during collection,					

	interpretation, and dissemination of data and in all professional activities.					
12	Lead multidisciplinary teams, develop solution methodologies for complex problems and take responsibility					

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks: 13x Total course hours)	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	8	112
Midterm examination	1	(15+2)	17
Project	1	50	50
Final examination	1	(20+3)	23
Total Work Load			241
Total Work Load / 25 (h)			9.6
ECTS Credit of the Course			10