

Chemical Water Treatment

Course Name	Course type (credit/hours)		Required course(3/3)		Course code	E043
	Target students Division/major/grade		Environmental and safety Engineering/Junior		Opening semester	2021 2ND SEMESTER
	Class time and classroom		Tue B(WEB239)Thu A(WEB239)		English Grade	A(100%English)
Reference to this course	Prerequisite courses					
	Related basic courses		Environmental chemistry, Water quality analysis, Biological water treatment, Physical water treatment			
	Recommended concurrent courses					
	Related advanced courses					
Instructor	Name (title/division)		Chang-Gu Lee(Assistant Professor, Environmental and safety Engineering)			
	Office Room Number	Palda1 706	Office phone Number	2405	e-mail	
	Office hours	Thursday (1:30~3:30)		Homepage address		
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

1. Introduction

This course will cover the industrial wastewater properties and chemical treatment processes. This course deals with the basic principles and design factors of coagulation, precipitation, chemical oxidation, advanced oxidation, and ion exchange processes.

2. Course Objectives

Learn the basic principles and application methods of chemical treatment methods applied to treat various wastewater generated by industries.

3. Class types and activities

Lecture
Assignments

4. Teaching Method

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| <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> discussion and debate |
| <input type="checkbox"/> team project(presentation and case studies) | <input type="checkbox"/> experiments(role-playing,etc) |
| <input type="checkbox"/> designing and production | <input type="checkbox"/> on-site learning(on-site training) |
| <input type="checkbox"/> others | |

5. Support Systems in Use

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|--|---|---|
| <input checked="" type="checkbox"/> AjouBb | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture | <input type="checkbox"/> online content | |
| <input type="checkbox"/> class behavior analyzing system | <input checked="" type="checkbox"/> others (ZOOM) | |

6. Teaching Tools

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| <input type="checkbox"/> PBL(Problem Based Learning) | <input checked="" type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning) |
| <input type="checkbox"/> UR(Undergraduate Research) | <input type="checkbox"/> FL(Flipped Learning) | <input type="checkbox"/> DSAL(Data Science Active Learning) |
| <input type="checkbox"/> others | | |

7. Knowledge and ability required for taking this course

Basic Chemical Knowledge

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		10%	
midterm exam	1	35%	
final exam	1	35%	
quiz			
presentation			
discussion			
homework		20%	
etc			
study hours	4 hr/week		

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Main	Wastewater Engineering, Fifth Edition	Metcalf&Eddy/Aecom	McGRAW-HILL International Edition	

10. Class system and Class shedule

Understanding of industrial wastewater properties and chemical properties → Unit process and operation → Industrial water disposal
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< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Introduction to wastewater treatment	K/E	Chang-Gu Lee	Lecture		
2	Wastewater Characteristics (1)	K/E	Chang-Gu Lee	Lecture		
3	Wastewater Characteristics (2)	K/E	Chang-Gu Lee	Lecture		
4	Role of Chemical Unit Process	K/E	Chang-Gu Lee	Lecture		
5	Fundamentals of Chemical Coagulation	K/E	Chang-Gu Lee	Lecture		

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
6	Chemical Precipitation for Improved Plant Performance	K/E	Chang-Gu Lee	Lecture		
7	Chemical Phosphorus Removal	K/E	Chang-Gu Lee	Lecture		
8	Midterm	K/E	Chang-Gu Lee		Exam	
9	Chemical Formation of Struvite	K/E	Chang-Gu Lee	Lecture		
10	Conventional chemical oxidation	K/E	Chang-Gu Lee	Lecture		
11	Advanced oxidation	K/E	Chang-Gu Lee	Lecture		
12	Photolysis	K/E	Chang-Gu Lee	Lecture		
13	Chemical Neutralization	K/E	Chang-Gu Lee	Lecture		
14	Chemical Storage	K/E	Chang-Gu Lee	Lecture		
15	Ion Exchange	K/E	Chang-Gu Lee	Lecture		
16	Final	K/E	Chang-Gu Lee		Exam	

11. Other items of notification

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