Reaction Engineering 1

Course Name	Course type (credit/hours)	Required course(3/3)	Course code	D064
	Target students Division/major/grade	Chemical Engineering/Junior	Opening semester	2020 1ST SEMESTER
	Class time and classroom	Tue A(WEB303)Fri A(WEB303)	English Grade	A(100%English)
Reference to this course	Prerequisite courses	물리화학		
	Related basic courses			
	Recommended concurrent courses			
	Related advanced courses	반응공학2		

Instructor	Name (title/division)	PARK, EUN DUCK(Professor, Energy Systems Research)				
	Office Room Number	서관 204호	Office phone Number	2384	e-mail	
	Office hours	화요일 17:00-18:00	Homepage address	http://home.ajou.ac.kr/homesite/green/		
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

1. Introduction

The objective of this course is to help students to understand the chemical reaction phenomena as well as the basic principles for the reactor design. Students will learn some important topics including chemical reaction kinetics, heat and mass transfer. The analysis for the ideal reactors will be conducted.

2. Course Objectives

1. Course objective
Based on reaction kinetics as well as material and energy balance, students can design the ideal reactors under given constraints.

2. Course accomplishment
1.We can apply the knowledge on mathematics, basic science, and engineering as well as the information technology to the chemical engineering problems.

2.We can understand and analyze the information on chemical reaction engineering and plan and carry out the experiment related to chemical reaction engineering.

3.We can design the system, components, and process based on the real constraints.

4.We can understand, formulate, and solve the chemical reaction engineering.
5.Wecanutilizethetechniques,methods,andtoolsnecessaryforchemicalengineeringthermodynamics.

3. Class types and activities

The lecture will proceed based on the textbooks.
The lecturer will encourage questions from students.
All the students will participate the team design projects and have an opportunity to present their work.
The examination will be taken after each chapter to evaluate the students' comprehension on the important issues.

4. Teaching Method

- [V] lecture
- [V] team project(presentation and case studies)
- [V] designing and production
- [ ] others
- [ ] discussion and debate
- [ ] experiments(role-playing,etc)
- [ ] on-site learning(on-site training)

5. Support Systems in Use

- [V] AjouBb
- [ ] cyber lecture
- [ ] class behavior analyazing system
- [ ] automatic recording system
- [ ] online content
- [ ] others
- [ ] web-based assignment

6. Teaching Tools

- [V] PBL(Problem Based Learning)
- [ ] UR(Undergraduate Research)
- [ ] others
- [ ] CBL(Case Based Learning)
- [ ] FL(Flipped Learning)
- [V] TBL(Team Based Learning)
- [ ] DSAL(Data Science Active Learning)

7. Knowledge and ability required for taking this course

Students are required to solve basic differential and integral equations. They also have to have basic knowledge on physical and organic chemistry.

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		10%	출석 및 태도
midterm exam			
final exam			
quiz			
presentation	2회	30%	설계과제 수행 및 발표: 2회 보고서도 포함해서 평가함.
discussion			
homework			
etc		60%	진도 고사
study hours			

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Sub	Chemical Reaction Engineering	Octave Levenspiel	John Wiley & Sons	1999
Main	Elements of Chemical Reaction Engineering	H. Scott Fogler	Prentice-Hall Intern	1999

10. Class system and Class shedule

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Introduction & Mole Balance	E	PARK, EUN DUCK	lecture		
2	Conversion and Reactor sizing	E	PARK, EUN DUCK	lecture		
3	Rate Laws and Stoichiometry	E	PARK, EUN DUCK	lecture		

< Class Schedule >

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Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
4	Rate Laws and Stoichiometry	E	PARK, EUN DUCK	lecture		
5	Isothermal Reactor Design	E	PARK, EUN DUCK	lecture		
6	Isothermal Reactor Design	E	PARK, EUN DUCK	Project		
7	Isothermal Reactor Design	E	PARK, EUN DUCK	Project	Project evaluation	
8	중간고사	E	PARK, EUN DUCK	mid-term exam.		
9	Collection and Analysis of rate data	E	PARK, EUN DUCK	lecture		
10	Multiple Reactions	E	PARK, EUN DUCK	lecture		
11	Reaction Mechanism, Pathways, Rioreactions and Bioreactors	E	PARK, EUN DUCK	lecture		
12	Reaction Mechanism, Pathways, Rioreactions and Bioreactors	E	PARK, EUN DUCK	Project		
13	Nonisothermal Reactor Design	E	PARK, EUN DUCK	Project		
14	Nonisothermal Reactor Design	E	PARK, EUN DUCK	Project		
15	Nonisothermal Reactor Design	E	PARK, EUN DUCK	Project	Project evaluation	
16	기말고사	E	PARK, EUN DUCK	Final exam.		

11. Other items of notification