

## Chemical Engineering Thermodynamics 1

Course Name	Course type (credit/hours)	Required course(3/3)	Course code	D044
	Target students Division/major/grade	Chemical Engineering/Sophomore	Opening semester	2020 2ND SEMESTER
	Class time and classroom	Tue A(WEB303)Fri A(WEB303)	English Grade	A(100%English)
Reference to this course	Prerequisite courses			
	Related basic courses			
	Recommended concurrent courses			
	Related advanced courses	화공열역학 2		

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	2946	e-mail	

### 1. Introduction

Various basic thermodynamic properties of the pure fluid used in the chemical process are taught. The first, second, and third law of thermodynamics are also covered. Moreover, you learn how these thermodynamic properties as well as the laws of thermodynamics can be applied in chemical engineering. Additionally, some problems related to the topics, such as how the thermodynamics can be applied to the fluid flow and how much heat can be converted into the mechanical energy, are dealt with.

### 2. Course Objectives

#### 교육목표

- 열역학 제1법칙, 제2법칙, 제3법칙과 물질들의 특성적인 열역학적 성질을 이용하여 화학공학에 관련된 제반 문제들을 이해시킨다.
- 화학공학에 관련된 문제들을 해석하고 실제 system에 응용할 수 있는 능력을 배양시킨다.

#### 교과목 학습성과

1. 수학, 기초과학, 공학의 지식과 정보기술을 응용할 수 있다.
2. 자료를 이해하고 분석할 수 있으며 실험을 계획하고 수행할 수 있다.
3. 현실적 제한조건을 반영하여 시스템, 요소, 공정을 설계할 수 있다.
4. 공학문제들을 인식하며, 이를 공식화하고 해결할 수 있다.
5. 공학실무에 필요한 기술, 방법, 도구들을 사용할 수 있다.

### 3. Class types and activities

### 4. Teaching Method

<input checked="" type="checkbox"/> lecture	<input type="checkbox"/> discussion and debate
<input checked="" 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

<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 type="checkbox"/> others	

### 6. Teaching Tools

<input type="checkbox"/> PBL(Problem Based Learning)	<input 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

미분 및 적분문제를 다룰 수 있는 능력과 물질의 물리화학적인 성질에 관한 기본적인 이해가 요구된다.

## 8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance			
midterm exam			
final exam			
quiz			
presentation			
discussion			
homework			
etc		100	시험: 60%, 설계과제:30%, 출석 및 태도:10%
study hours			

## 9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Sub	Chemical and Engineering Thermodynamics, 3e	Stanley I. Sandler	John Wiley & Sons, Inc.	1999
Main	Introduction to chemical engineering thermodynamic	J.M. Smith	McGraw-Hill	2001

## 10. Class system and Class shedule

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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		PARK, EUN DUCK	강의		
2	The first law and other basic concepts		PARK, EUN DUCK	강의		
3	Volumetric properties of pure liquids (1)		PARK, EUN DUCK	강의		

## < Class Schedule >

\* language : K-korean, E-English

Week s	Topics	lang uage	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
4	Heat effects		PARK, EUN DUCK	강의		
5	project		PARK, EUN DUCK	프로젝트수업		
6	project		PARK, EUN DUCK	프로젝트수업		
7	The second law of thermodynamics		PARK, EUN DUCK	강의		
8	중간고사		PARK, EUN DUCK			
9	Thermodynamoc properties of fluids		PARK, EUN DUCK	강의		
10	Applications of thermodynamics to flow processes		PARK, EUN DUCK	강의		
11	Production of power from heat		PARK, EUN DUCK	강의		
12	Refrigeration and liquefaction		PARK, EUN DUCK	강의		
13	프로젝트수업		PARK, EUN DUCK	프로젝트수업		
14	프로젝트수업		PARK, EUN DUCK	프로젝트수업		
15	프로젝트수업		PARK, EUN DUCK	프로젝트수업		
16	기말 고사		PARK, EUN DUCK	기말고사		

## 11. Other items of notification