# Syllabus

## Advanced Thermodynamics

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|---|---|---|---|---|---|
| Course Name | Course type (credit/hours) | 전선(3/3) | | Course code | |
| | Target students Division/major/grade | / | | Opening semester | 2018년 1학기 |
| | Class time and classroom | 월11(서302) 월12(서302) 월13(서302)(서302) | | | |
| Reference to this course | Related basic courses | | | | |
| | Recommended concurrent courses | | | | |
| | Related advanced courses | | | | |
| Instructor | Name (title/division) | 박명준 (조교수/ 화공・신소재공학부) | | | |
| | Office Room Number | | Office phone Number | 2383 | e-mail | mjpark@ajou.ac.kr |
| | Office hours | | Homepage address | | |
| Teaching Assistant | Name (title/division) | | | | |
| | Office Room Number | | Office phone Number | | e-mail | |

## 1. Introduction

This lecture covers theories on the chemical thermodynamis and its application to how to calculate the physico-chemical properties of pure and mixtures.
Details are:
- First and second law of thermodynamics
- Thermodynamic calculus
- Criterion for the equilibrium and stability
- Relationship of properties between pure and mixtures.

## 2. Course Objectives

## 3. Class types and activities

## 4. Teaching Method

Classes are mainly based on the lectures and presentations. Homework will be assigned as necessary.

강의를 중심으로 수업을 진행하며, 강의내용에 대한 이해를 도울 수 있도록 과제물을 적극 활용한다.

## 5. Knowledge and ability required for taking this course

## 6. Method of Evaluation

| Evaluation Item | The Number of Times | Evaluation Proportion | Remarks |
|---|---|---|---|
| Attendance | | | |
| midterm exam | | | |
| final exam | | | |
| quiz | | | |
| presentation | | | |
| discussion | | | |
| homework | | | |
| etc | | | |

Exam 60%, Homework 30%, Attendance 10%

지필고사 60%, 과제 30%, 출석 10%

## 7. Textbooks

| Main/Sub | Title | Writer | Publisher | Publication year |
|---|---|---|---|---|
| 주교재 | Thermodynamics and Its Applications | Tester | Prentice H | 1997 |

## 8. Lecture Schedule

| Week | Lecture contents | Lesson type | Remark |
|---|---|---|---|
| 1 | Fundamental Principles I | Lecture | |
| 2 | Basic Concepts and Difinitions | Lecture | |
| 3 | Energy and the First Law – Work iInteractions & Energy | Lecture | |
| 4 | Energy and the First Law – The Ideal Gas, The First Law for Closed/Open Systems | Lecture | |
| 5 | Reversibility | Lecture | |
| 6 | – The Second Law<br>– The Combined First and Second Laws | Lecture | |
| 7 | Reversible Work of Expansion of Compression | Lecture | |
| 8 | Calculus of Thermodynamics | Lecture | |
| 9 | Calculus of Thermodynamics | Lecture | |
| 10 | Legendre Transformations | Lecture | |
| 11 | – Classification of Equilibrium State<br>– Phase Equilibria | Lecture | |
| 12 | Criteria of Stability | Lecture | |
| 13 | Properties of Pure Materials – PVT behavior | Lecture | |
| 14 | Properties of Pure Materials – Evaluating Changes in Properties | Lecture | |
| 15 | Propertiy Relationships for Mixtures | Lecture | |
| 16 | Examination | Exam | |

## 9. Others