

Syllabus

Energy Physical Chemistry

Course Name	Course type (credit/hours)	전필(3/3)			Course code	
	Target students Division/major/grade	/			Opening semester	2017년 2학기
	Class time and classroom	월9(전109) 월10(전109) 월11(전109)(전109)				
Reference to this course	Related basic courses					
	Recommended concurrent courses					
	Related advanced courses					
Instructor	Name (title/division)					
	Office Room Number		Office phone Number	2896	e-mail	yukwonkim@ajou.ac.kr
	Office hours		Homepage address			
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

1. Introduction

This lecture deals with various topics related to energy, which are fossil fuel, renewable energy-related materials, fuel cell, battery, and environmental friendly materials and discusses these issues based on fundamental physical chemistry concepts such as thermodynamics, quantum mechanics, statistical mechanics, spectroscopy, kinetics and dynamics. The primary goal of this course is to provide students with key concepts in physical chemistry in relation to energy with an aim to enhance student's ability to carry out a higher level research. General chemistry is required to take this course.

2. Course Objectives

3. Class types and activities

4. Teaching Method

Lecture and presentations

5. Knowledge and ability required for taking this course

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6. Method of Evaluation

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

Quizzes 40 % Report/Presentation30 % Attendance30 %
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7. Textbooks

Main/Sub	Title	Writer	Publisher	Publication year
주교재	The Physical Chemistry of Materials : Energy and Environmental Applications	Rolando M.A. Roque-Malherbe	CRC Press	2010
부교재	Lecture notes			

8. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	Introduction	Lecture	
2	Materials Physics	Lecture	
3	Structure of Adsorbents, Ion Exchangers, Ion Conductors, Catalysts	Lecture	
4	Structure of Adsorbents, Ion Exchangers, Ion Conductors, Catalysts	Lecture	
5	Material Characterization Methods : X-ray	Lecture	
6	Material Characterization Methods : IR and Raman	Lecture	
7	Material Characterization Methods : Magnetic Resonance	Lecture	
8	Midterm Exam	Lecture	
9	Diffusion in Materials	Lecture	
10	Adsorption in Nanoporous Materials	Lecture	
11	Ion Exchange	Lecture	
12	Solid State Electrochemistry	Lecture	
13	Heterogeneous Catalysis	Lecture	
14	Membranes	Lecture	
15	Review/Presentation	Lecture	
16	Final exam	Exam	

9. Others

Supplementary materials provided need to be read carefully.