이화여자대학교
EWHA WOMANS UNIVERSITY

Syllabus (2021-Spring)

Course Title	물리유기화학 Physical Organic Chemistry	Course No.	37423-01
Department/ Major	화학·나노과학 Chemistry and Nano Science	Credit/Hours	3
Class Time/ Classroom	Online Class Mon. (월) 09:30-10:45 Thurs. (목) 11:00-12:15		
Instructor	Name Jean Bouffard (잔 보파드)	Department: 화학·나노과학 Chemistry and Nanoscience	
	E-mail bouffard@ewha.ac.kr	Phone 3277-3427	
Office Hours/ Office Location	종합과학관 D동 402호 / General Science D402 Office Hours : By Appointment		

I. Course Overview

1. Course Description

Physical organic chemistry is concerned with the structure, properties, and reactivity of organic molecules, in particular that of important reaction intermediates. Furthermore, physical organic chemistry involves the use of physical methods (kinetics, spectroscopy, etc.) to study and elucidate organic reactions mechanisms experimentally. The student who takes this class will develop a deeper understanding of the factors that govern organic reactivity and reaction mechanisms, with the goal of developing the skills to predict properties and reactivity, as opposed to a purely descriptive account of families of reactions.

2. Prerequisites

37423 Physical Organic Chemistry is an **advanced** undergraduate organic chemistry class. Consequently, having successfully completed 20569 Organic Chemistry I is a **prerequisite**, and having successfully completed 20570 Organic Chemistry II is **strongly** recommended.

3. Course Format

Lecture	Discussion/Presentation	Experiment/Practicum	Field Study	Other
100%	%	%		%

Explanation of course format: This class will use a combination of PowerPoint slides and board-based lectures, plus some problem-solving sessions. Additional handouts on a given topic will be distributed as required.

4. Course Objectives

The student who takes this class will develop a deeper understanding of the factors that govern organic reactivity and reaction mechanisms, with the goal of developing the skills to predict properties and reactivity, as opposed to a purely descriptive account of families of reactions.

5. Evaluation System

☐ Relative evaluation ☐ Absolute evaluation ■ Others : Semi-Absolute Method (see below)

- Explanation of evaluation system:

  - No fixed numbers of A's, B's, C's etc. for this class.
  - Students final scores are compared to the score of the class' top student.
  - ≥ 80% of the top score for A's; ≥ 60% of the top score for B's; ≥ 40% of the top score for C's; ≥ 20% of the top score for D's.
  - In all cases, letter-grade modifiers (+/0/-) are left at the discretion of the professor.

Midterm Exam	Final Exam	Quizzes	Presentation	Projects	Assignments	Participation	Other
50%	50%	%	%	%	%	%	%

• Total: 200 pts.

Midterm Exam: 100 pts.

Final Exam: 100 pts.

• Students will be allowed to bring their own 1-page (A4, double-sided) *vade mecum* to the exams in this class.

II. Course Materials and Additional Readings

1. Required Materials

• *Recommended Textbook:*

1) J. Clayden, N. Greeves, S. Warren, "Organic Chemistry", 2nd ed., 2012, Oxford Academic Press.

2. Supplementary Materials

• *Suggested Readings / Additional References:*

2) F. A. Carey, R. J. Sundberg, "Advanced Organic Chemistry - Part A: Structure and Mechanisms", (several editions available), Kluwer Academic / Plenum Publishers

3) E. V. Anslyn, D. A. Dougherty, "Modern Physical Organic Chemistry", 2006, University Science Books.

4) I. Fleming, "Frontier Orbitals and Organic Chemical Reactions", 1976, Wiley.

5) N. J. Turro, "Modern Molecular Photochemistry", 1991, University Science Books.

3. Optional Additional Readings

III. Course Policies

* Practice problem sets will be distributed before the midterm and final exams. Completing these exam practice problem sets is optional (will not count in course grade), but is **highly recommended** to prepare for the exams.

* Students who want to meet with the professor can request an appointment by e-mail (bouffard@ewha.ac.kr), or simply visit my office (General Science D402). However, to guarantee that I am available to help you, taking an appointment is preferable.

* Students should give the professor an email address at which they can be reached.

IV. Course Schedule (15 credit hours must be completed.)

Week	Date	Topics & Class Materials, Assignments
Week 1	**(03/01)**	No class – Independence Movement Day
	(03/04)	Introduction, Structure and Bonding (Clayden ch. 4)
Week 2	(03/08)	Stability and Strain, Conformational Analysis (Clayden ch. 14, 16, 31, 34)
	(03/11)	
Week 3	(03/15)	Stereoelectronic Effects, Stereochemistry (Clayden ch. 14, 16, 31, 34)
	(03/18)	
Week 4	(03/22)	Nucleophilicity (Clayden ch. 6, 11, 15)
	(03/25)	
Week 5	(03/29)	Structure, Properties and Reactivity of Intermediates: Carbocations (Clayden ch. 36)
	(04/01)	
Week 6	(04/05)	Structure, Properties and Reactivity of Intermediates: Carbanions (Clayden ch. 8)
	(04/08)	
Week 7	(04/12)	Structure, Properties and Reactivity of Intermediates: Radicals (Clayden ch. 37)
	(04/15)	
Week 8	(04/19)	Structure, Properties and Reactivity of Intermediates: Carbenes, carbenoids, nitrenes, and nitrenoids (Clayden ch. 38)
Week 9	**(04/22)**	No class – Midterm Exams Period
	(04/26)	Structure, Properties and Reactivity of Intermediates: Carbenes, carbenoids, nitrenes, and nitrenoids (Clayden ch. 38); Review & Problem-Solving Session
	(04/29)	Midterm Exam: 05/01 (Sat.) 14:00-16:00
Week 10	(05/03)	Study & Determination of Reaction Mechanisms (Clayden ch. 12, 39)
	(05/06)	
Week 11	(05/10)	Correlations in Organic Chemistry (LFER)
	(05/13)	
Week 12	(05/17)	Catalysis (Clayden ch. 39)
	(05/20)	
Week 13	(05/24)	Concerted Pericyclic Reactions I (Clayden ch. 34)
	(05/27)	
Week 14	**(05/31)**	No class – Ewha's Anniversary

Week	Date	Topics & Class Materials, Assignments
	(06/03)	Concerted Pericyclic Reactions II (Clayden ch. 34)
Week 15	(06/07)	Organic Photochemistry (handouts), Review & Problem-Solving Sessions
	(06/10)	
Makeup Class	(06/14)	Final Exam: 06/14 (Mon.) 19:00-21:00
Makeup Class	(06/17)	

V. Special Accommodations

* According to the University regulation section #57-3, students with disabilities can request for special accommodations related to attendance, lectures, assignments, or tests by contacting the course professor at the beginning of semester. Based on the nature of the students' request, students can receive support for such accommodations from the course professor or from the Support Center for Students with Disabilities (SCSD). Please refer to the below examples of the types of support available in the lectures, assignments, and evaluations.

Lecture	Assignments	Evaluation
. Visual impairment : braille, enlarged reading materials . Hearing impairment : note-taking assistant . Physical impairment : access to classroom, note-taking assistant	Extra days for submission, alternative assignments	. Visual impairment : braille examination paper, examination with voice support, longer examination hours, note-taking assistant . Hearing impairment : written examination instead of oral . Physical impairment : longer examination hours, note-taking assistant

- Actual support may vary depending on the course.

* The contents of this syllabus are not final—they may be updated. Unforeseen adjustments to the class schedule (and/or the use of online classes) may be unavoidable depending on the evolution of the Covid-19 situation.