

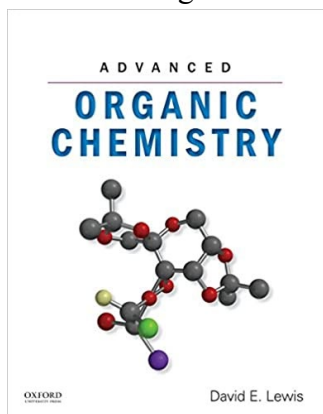
## Chem 4400/6400 - Mechanistic Organic Chemistry

Fall, 2020

This course will be taught **ONLINE** due to the outbreak of the COVID-19 pandemic. The instructor will post the videos of the lectures covering various segments of the textbook on iCollege. The videos are available to the students at any time. So this is an **ASYNCHRONOUS** course.

### Required Textbook

Advanced Organic Chemistry, David Lewis, Oxford University Press 2016



### Study Goal

This course teaches advanced topics in the description of the structures of organic molecules, interpretation of reactivities enabled by the structures, characterization of intermediates in organic reactions, and investigation of the reaction mechanisms. By completing this course, students will be able to analyze structure-reactivity relationships of organic molecules, design experiments to interrogate the reaction mechanisms, and understand a broad scope of reactions to guide the planning of effective synthesis of a target molecule.

### Methods of Study

Students should follow the lectures about various topics on iCollege, read the assigned textbook sections, and complete the homework so they can transform their understanding of organic chemistry to problem-solving skills.

### Instructor:

Dr. Jun Yin

NSC 571, office hours by appointment

Phone: 404-413-6090

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### Grade Assignment

Grades will be assigned based on three midterm exams. The third midterm exam will be on the date of the scheduled final exam. All exams will be take-home and open-book exams. One midterm exam of the lowest score will be excluded from counting the final grade of the exam.

The take-home exam should be complete by the students independently without consulting with other students in the class or any other people.

**Chemistry Department Student Conduct and Integrity Policy applies to the take-home exam of this course.**

- All tests taken and homework must represent your individual, unaided efforts.
- To receive or offer information during an examination or on homework assignments is cheating.
- Use of graded materials from previous terms is not allowed. Students are not allowed to contact faculty or students at other institutions for help.
- Conduct or actions that disrupt class or test periods or falsification of information related to chemistry courses by any student will be taken as violation of the policies of the Board of Regents of the University System of Georgia and the GSU Student Code of Conduct, Section 6.0.
- Any suspected offenses may be referred to the Department Chair or the Dean of Students for appropriate disciplinary action.

## Lecture Schedule

Week	Date	Topic	Chapter
1	August 24	Structure, bonding and reactivity of organic molecules	1
		Stereochemistry	2
2	31	Asymmetric synthesis	2
		Orbitals and reactivities	4
3	September 7	Frontier orbitals and chemical reactions	5
4	14	Pericyclic reactions	6
5	21	<b>Midterm exam 1</b>	
		Aromaticity	7
6	28	Aromaticity	7
		Reaction mechanism and kinetics	8
7	October 5	Linear free energy relationships	8
8	12	Kinetic isotope effects	8
		Carbocations	9
9	19	Carbocations	9
		Synthetic reactions with carbocations	10
10	26	Synthetic reactions with carbocations	10
		Carbanions	11
11	November 2	<b>Midterm exam 2</b>	
		Carbanions	11
12	9	Reaction of carbon nucleophiles, substitution and addition	12
13	16	Free radicals, carbenes, Arynes, and nitrenes	13
14	23	<i>Thanksgiving break, no class</i> <i>Thanksgiving break, no class</i>	
15	30	Free radicals involved in synthesis	14
16	December 7	<b>Midterm exam 3</b>	