# **Basic Principles of Organic Chemistry, Fall 2024**

# **Course Information**

CHM 5224 (3 Credits), also as CHM 4930 Meeting times: MWF, Period 3 (9:35–10:25 am) Classroom location: SFH 221 Office hours: Wednesdays 12–1 pm, or by appointment Optional discussion sections: Thursdays 6:15–7:05 pm Discussion section location: FLI 109

# Instructor Information Dr. Kaibo Feng Office location: SFH 406G Phone: 352-273-2262 Email address: <u>kfeng2@ufl.edu</u> Anghelo Gangano, Teaching Assistant Email address: <u>anghelo.gangano@chem.ufl.edu</u>

# **Course Description**

This class will cover the fundamental principles pertinent to organic synthesis. Special emphasis will be placed on reactivity, arrow pushing, classic reactions, and transition-metal catalysis. Upon completion of this class, students will be able to:

- Provide mechanistic rationales for organic reactions
- Predict the outcomes of reactions based on mechanistic understanding
- Determine the electron count and predict the reactivity of transition-metal complexes
- Identify key intermediates, oxidation states, and the role of each step in a catalytic cycle

# **Course Content**

We will roughly follow the required Grossman textbook with additional materials from other sources, including primary literatures and the recommended texts listed below. The class will be divided into the following units:

- The Basics
- Polar Reactions Under Basic Conditions
- Polar Reactions Under Acidic Conditions
- Pericyclic Reactions
- Radical Reactions
- Transition-Metal Catalysis

## **Required Textbook**

• The Art of Writing Reasonable Organic Reaction Mechanisms, 2<sup>nd</sup> or 3<sup>rd</sup> Ed., Robert B. Grossman.

## **Additional Literature Resources**

- Organometallic chemistry lecture notes, CHEM 538, University of Illinois, M. Christina White: <u>https://whitegroupillinois.wixsite.com/thewhitegroup/copy-of-c-h-to-c-o-hydroxylations/</u>
- Advanced Organic Chemistry, Part A, 5<sup>th</sup> Ed., Francis A. Carey and Richard J. Sundberg. Electronic version available at <u>https://link.springer.com/book/10.1007/978-0-387-44899-2</u>.
- Strategic Applications of Named Reactions in Organic Synthesis, Laszlo Kurti and Barbara Czako.
- The Organometallic Chemistry of the Transition Metals, 5<sup>th</sup> Ed., Robert Crabtree.

# Assessment

- There will be 3 exams (100–150 pts each) on select Thursdays (see calendar for details).
- The exams are cumulative but will mainly focus on materials covered since the previous exam.
- The exams will be curved.

- A request to regrade an exam must be submitted within one week after the exam is returned. This request will cause the entire exam to be regraded for accuracy.
- There will be no lecture on the Friday immediately following an exam.
- Problem sets with questions resembling those you will see in the exams will be distributed during the semester. These problem sets are designed to help you prepare for the exams and will not be graded. The answer keys will be provided.

## **Course Expectations and Policies**

- Due to the complex nature of organic chemistry, attending lectures is integral to your success in this course. Students are expected to attend all lectures. However, attendance will not be recorded.
- Please refrain from using cellphones or small electronic devices during lecture, unless so directed.
- Unless otherwise indicated, there will be a discussion/Q&A section with Anghelo Gangano in FLI 109 every Thursday, Period 11 (6:15–7:05 pm), to go over practice problems and exams (see calendar for details). Attendance to the discussion section is optional but recommended.
- The sharing of course materials with anyone outside of the class is strictly prohibited.
- Students are expected to take all exams at the scheduled times. Excused exam absences are allowed per university policy, if documented and disclosed to me at least one week ahead of the conflict. These requests will be evaluated on a case-by-case basis. If approved, the conflict exam will be taken prior to the scheduled exam. Medical emergencies will be accommodated through special arrangements with proper documentation.

## Special Accommodations for Students with Disabilities

If you need disability-related accommodations, please first register with the Dean of Students Office. The Dean of Students Office will provide you the documentation, which you will then need to provide me. I look forward to working with you to assist you with your approved accommodations.

## **UF Honor Code**

The UF Student Honor Code (<u>https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/</u>): We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Student Honor Code. On all work submitted for credit by Students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Honor Code violations include copying on an exam (or helping another student to copy) and/or turning in an exam for regrading that has been altered since it was graded by the instructor. Any student found responsible for an academic honesty violation in this course will receive a zero (0) for the compromised exam and be recommended for sanctions consistent with the offense.

## **Course Evaluations**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <u>https://gatorevals.aa.ufl.edu</u>. Evaluations are typically open during the last two or three weeks of the semester, but students will be informed of the specific times when they are open. Summary results of these assessments are available to students at <u>https://gatorevals.aa.ufl.edu/public-results/</u>.

## **Course Calendar (Subject to Change)**

Monday	Wednesday	Thursday	Friday
(9:35–10:25 am)	(9:35–10:25 am)	(6:15-7:05 pm, FLI 109)	(9:35–10:25 am)
			8/23 – The Basics
8/26 – The Basics	8/28 – The Basics	8/29 – Discussion/Q&A	8/30 – The Basics
9/2 - No class	9/4 – The Basics	9/5 – Discussion/Q&A	9/6 - Reactions Under
(Labor Day)			Basic Conditions
9/9 – No class	9/11 – Reactions Under	9/12 - Reactions Under	9/13 – Reactions Under
(Moved to Thursday)	Basic Conditions	Basic Conditions (FLI 109)	Basic Conditions
9/16 - Reactions Under	9/18 – Reactions Under	9/19 – Discussion/Q&A	9/20 - Reactions Under
Basic Conditions	Acidic Conditions		Acidic Conditions
9/23 – Reactions Under	9/25 – Reactions Under	9/26 – Discussion/Q&A	9/27 – Reactions Under
Acidic Conditions	Acidic Conditions		Acidic Conditions
9/30 - Pericyclic	10/2 – Pericyclic	10/3 – Exam 1	10/4 – No class
Reactions	Reactions	( <b>6:15-8:15 pm</b> , FLI 109)	(Day after exam)
10/7 - Pericyclic	10/9 – Pericyclic	10/10 – Discussion/Q&A	10/11 - Pericyclic
Reactions	Reactions		Reactions
10/14 - Radical	10/16 - Radical	10/17 – Discussion/Q&A	10/18 - No class
Reactions	Reactions		(Homecoming)
10/21 - Radical	10/23 – Radical	10/24 – Discussion/Q&A	10/25 – Radical
Reactions	Reactions		Reactions
10/28 – Transition-	10/30 - Transition-Metal	10/31 – Discussion/Q&A	11/1 - Transition-Metal
Metal Catalysis	Catalysis		Catalysis
11/4 - Transition-Metal	11/6 - Transition-Metal	11/7 – Exam 2	11/8 – No class
Catalysis	Catalysis	(6:15-8:15 pm, FLI 109)	(Day after exam)
11/11 - No class	11/13 - Transition-Metal	11/14 – Discussion/Q&A	11/15 – Transition-Metal
(Veterans Day)	Catalysis		Catalysis
11/18 – Transition-	11/20 - Transition-Metal	11/21 – Discussion/Q&A	11/22 – Transition-Metal
Metal Catalysis	Catalysis		Catalysis
11/25 - No class	11/27 - No class	11/28 - No discussion	11/29 – No class
(Thanksgiving week)	(Thanksgiving week)	(Thanksgiving week)	(Thanksgiving week)
12/2 - Transition-Metal	12/4 - Transition-Metal	12/5 – No discussion	12/6 – No class
Catalysis	Catalysis	(Reading Day)	(Reading Day)
12/9 - No class	12/11 - No class	12/12 – Exam 3	
(Finals week)	(Finals week)	(12:30-2:30 pm, SFH 221)	