

CHEM 6394: STEREOCHEMISTRY

Spring 2024 (January 18th–May 7th 2024)

Instructor: Prof. Ognjen Š. Miljanić* ▪ miljanic@uh.edu ▪ 5028 SERC Building
tinyurl.com/uh446f2

CHEM 6394 is a graduate-level Stereochemistry course, and it follows a related mechanistic course, CHEM 6311. The course will cover the concepts of planar, axial, and topological chirality, methods for studying stereochemical phenomena, conformational analysis, stereoselectivity in chemical reactions, and some of the principles of enantioselective reactions. Throughout the course, we will try to provide a balanced analysis of organic and inorganic stereochemistry.

<i>Prerequisites</i>	CHEM 6311: MECHANISMS OF REACTIONS or Prof. Miljanić's consent.	
<i>Class Meetings</i>	<u>Lectures</u> 8:30a–10:00a Tue/Thu, 203 SEC No class on 01/16, 01/23, 01/25, 02/13, 03/12, and 03/14.	
	<u>Office Hours</u> By appointment, please email Prof. Miljanić to schedule a meeting.	
<i>Exams and Grading</i>	<u>Midterms</u> February 27 th 2024, 8:30a–10:00a, 203 SEC 200 pts April 2 nd 2024, 8:30a–10:00a, 203 SEC 200 pts <u>Production of a 3D Printed Model</u> 200 pts Students will be required to produce a 3D printed model illustrating a concept of interest to stereochemistry. The cost of printing will be covered by Prof. Miljanić's grant funds. <u>Final Exam</u> May 7 th 2024, 8:00a–10:00a, 203 SEC 350 pts <u>Class Attendance & Participation</u> 50 pts Total number of points is 1000.	
	There are no makeups for the midterms and the final exam. <u>In extreme emergencies, the exam you missed will not be counted towards the final grade.</u> In such cases, contact Prof. Miljanić immediately to discuss options.	

Last day to drop the course without grade—Wednesday 01/31/2024

Last day to drop the course—Wednesday 04/17/2022

<i>Recommended Reading</i>	Ernest L. Eliel & Samuel H. Wilen: <i>Stereochemistry of Organic Compounds</i> Henry B. Kagan: <i>Organic Stereochemistry</i> David L. Kepert: <i>Inorganic Stereochemistry</i> Alexander von Zelewsky: <i>Stereochemistry of Coordination Compounds</i>
	You will find lecture notes and the course website extremely useful too.

* Prof. Miljanić's name is phonetically pronounced as: Ogg-nyen Meel-yan-ich.

<i>Topics and Timeline (tentative)</i>	Date	Topic	Sections
	Tue 01/16	Class Cancelled Because of Freezing Weather	
	Thu 01/18	Syllabus discussion. Introduction. Shapes of Molecules	
	Tue 01/23	No class	
	Thu 01/25	No class	
	Tue 01/30	Symmetry and Structure	
	Thu 02/01	Methods for Structure Determination	
	Tue 02/06	Chirality: Introduction, Nomenclature, Tetrahedral Carbon	
	Thu 02/08	Point Chirality: Other Elements and Other Geometries	
	Tue 02/13	No class	
	Thu 02/15	Axial Chirality	
	Tue 02/20	Planar and Topological Chirality	
	Thu 02/22	Physical Properties of Enantiomers. Circular Dichroism	
	Tue 02/27	Midterm I, in class period	
	Thu 02/29	Diastereomers: Compounds with Multiple Stereocenters	
	Tue 03/05	Chemical Properties and Separation of Enantiomers	
	Thu 03/07	Physical Properties of Enantiomers	
	Tue 03/12	No class, Spring Break	
	Thu 03/14	No class, Spring Break	
	Tue 03/19	Diastereomers in Compounds with Multiple Stereocenters	
	Thu 03/21	Diastereomers of Compounds with C=C, C=N, N=N Bonds	
	Tue 03/26	Conformational Analysis: Rotamers of Acyclic Compounds	
	Thu 03/28	Conformational Analysis: Other Modes of Interconversion	
	Tue 04/02	Midterm II, in class period	
	Thu 04/04	Cyclohexane Conformations	
	Tue 04/09	Conformations of Other Rings and Bridged/Fused Systems	
	Thu 04/11	Inorganic Conformation Analysis: Co(en) ₃ ³⁺ and related	
	Tue 04/16	Dynamic Stereochemistry. Stereoselective Synthesis of Alkenes	
	Thu 04/18	Stereochemistry of Additions and Substitutions	
	Tue 04/23	Stereochemistry of Pericyclic Reactions	
	Thu 04/25	Enantioselective Synthesis	
		Enantioselective Catalysis. Origins of Homochirality on Earth	
	Tue 05/07	Final exam (8:00a–10:00a)	Comprehensive
<i>Counseling and Psychological Services (CAPS)</i>	<p>CAPS can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can Reach CAPS (uh.edu/caps) by calling (713) 743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the <i>Let's Talk</i> program, a drop-in consultation service at convenient locations and hours around campus.</p> <p style="text-align: center;">uh.edu/caps/outreach/lets_talk.html</p>		
<i>COVID-19 Information</i>	<p>Students are encouraged to visit the University's COVID-19 website for important information including on-campus testing, vaccines, diagnosis and symptom protocols, campus cleaning and safety practices, report forms, and</p>		

positive cases on campus. Please check the website throughout the semester for updates.

Face Covering Policy. To reduce the spread of COVID-19, the University strongly encourages everyone (vaccinated or not) to wear face coverings indoors on campus including classrooms for both faculty and students.

Presence in Class. Your presence in class each session means that you:

- Are NOT exhibiting any [Coronavirus Symptoms](#) that makes you think that you may have COVID-19
- Have NOT tested positive or been diagnosed for COVID-19
- Have NOT knowingly been exposed to someone with COVID-19 or suspected/presumed COVID-19

If you are experiencing any COVID-19 symptoms that are not clearly related to a pre-existing medical condition, do not come to class. Please see [Student Protocols](#) for what to do if you experience symptoms and [Potential Exposure to Coronavirus](#) for what to do if you have potentially been exposed to COVID-19. Consult the (select: [Undergraduate Excused Absence Policy](#) or [Graduate Excused Absence Policy](#)) for information regarding excused absences due to medical reasons.

Vaccinations. Data suggests that vaccination remains the best intervention for reliable protection against COVID-19. Students are asked to familiarize themselves with pertinent [vaccine information](#), consult with their health care provider. The University strongly encourages all students, faculty and staff to be vaccinated.

Excused Absence Policy. Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

Recording of Class. Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Center for](#)

[Students with DisABILITIES](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Syllabus Changes. Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through an announcement in class and over email.

*Reasonable Academic
Adjustments/Auxiliary
Aids*

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact [the Justin Dart Jr. Student Accessibility Center](#) (formerly the Justin Dart, Jr. Center for Students with DisABILITIES). For faster assistance, please contact Prof. Miljanić as soon as possible to discuss arrangements.
