Syllabus – Spring 2024

CHM2211 – Organic Chemistry 2

Sections: O224(21885) and O225(21886)

Instructor: Dr. Stefanie Habenicht
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Contact: Canvas message only (how-to)
Allow up to 48 hours for a response, not counting weekends and holidays.

Course Information

Course Objectives: The second half of the CHM 2210/2211 sequence, intended for majors and pre-professional students. This class will continue coverage of fundamental concepts of organic chemistry, including infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy, the structure, nomenclature, and reactivity of organometallic compounds, aldehydes, ketones, carboxylic acids and their derivatives, enolate anions and enamines, conjugated systems, aromatic compounds and amines.

Prerequisite: CHM2210 or the equivalent with a minimum grade of C (2.0)

Meeting Times: class #21885: T period 6 (12:50 PM–1:40 PM), R periods 6-7 (12:50 PM–2:45 PM)
class #21886: T periods 7-8 (1:55 PM–3:50 PM), R period 8 (3:00 PM–3:50 PM)

Classroom: Flint 50

Required: ALEKS for Organic Chemistry 2 (McGraw-Hill) – see Canvas for details before purchasing.

Recommended:

Textbook: Brown, Iverson, Anslyn and Foote, Organic Chemistry, 8th Edition (physical copy or eBook, Cengage Learning; ISBN: 978-1305580350).

Study Guide: Iverson, Organic Chemistry, Student Study Guide and Solutions Manual, 8th Edition (Cengage Learning, ISBN: 978-1305864504).

Purchasing Options: This course is participating in UF All Access, the least expensive and fastest way to get access to your course materials for the semester. Please visit the Bookstore All Access Site to opt-in and purchase your required Connect code, which will provide access to the ALEKS homework platform. Instructions will also be posted to Canvas.

E-Learning Website: All students will have access to the e-Learning website (Canvas): https://elearning.ufl.edu/. You will login with your GatorLink account username and password. General course information, lecture videos, important announcements, office hours, handouts, exam keys, and practice problems will be posted here. It is your responsibility to check Canvas often to make sure that you do not miss important announcements and to ensure that your gradebook is accurate. For computer assistance, visit http://helpdesk.ufl.edu/.

Computer Recommendations: Reliable access to a computer and the internet is recommended for this course. A student's computer configuration should include: a video card capable of showing typical web-based video content (preferably in HD), speakers and a microphone or headphones with built-in microphone, webcam, broadband connection to the internet and related equipment (Cable/DSL modem), Microsoft Office Suite installed (provided by the university) and a PDF viewer (e.g. Adobe Reader). You can find hardware recommendations here.

Office Hours:

Dr. Habenicht: to be announced – scheduling is based on student availability and preference.

Undergraduate teaching assistants (UGTA) will host weekly supplementary instruction (SI) sessions. A schedule will be posted to Canvas.

All office hour schedules are subject to change.

Recording Notice: Class meetings will be audio-visually recorded. Recordings will generally capture the lecture board and view of the instructor podium. Students who step into this space consent to being audio-visually recorded; students who participate orally are agreeing to have their voices recorded.

Assignments and Grading

Your grade will be based on the following items:

ALEKS modules	10%	
ALEKS pie score	2%	
Four (4) progress exams:	68%	(17% each)
Cumulative final exam:	20%	
TOTAL:	100%	

Your grade will be calculated based on the following grading scale:

	A: 92-100	**A-**: 89-91.99	
B+: 84-88.99	**B**: 79-83.99	**B-**: 74-78.99	
C+: 67-73.99	**C**: 60-66.99	**C-**: 55-59.99	
D+: 50-54.99	**D**: 45-49.99	**D-**: 40-44.99	**E**: <40

The instructor reserves the right to change the grading scale at any point during the semester.

Grades will be assigned in accordance with University policy.

ALEKS: You will complete a number of adaptive assignments (modules) whose goal is to help you master the course content (10% weight; all modules are weighted equally). Additionally, your overall ALEKS (pie) score will account for 2% of your grade.

Progress Exams: There will be four (4) 100-point progress exams given on campus in assembly (8:20 PM–9:50 PM). Progress exams will be cumulative but will emphasize material covered following the previous exam. Exam dates are listed in the course schedules at the end of this syllabus.

Final Exam: A cumulative final exam will be given on Monday, April 29, 2024 (7:30 AM–9:30 AM).

Exam Absence Policy: This course administers all conflicts with scheduled exams in accord with the University policy. University recognized conflicts include, but are not limited to, religious observances, participation in official university activities, military obligations, and court-imposed legal obligations. Students will be given the opportunity to take a makeup exam provided that the conflict is a) properly documented and b) disclosed to the instructor ***at least one week before*** the scheduled exam.

Unpredicted Absences due to medical or sudden family emergencies are not covered under the above conflict exam policy. A student who is absent for an exam due to one of the reasons listed above must contact the instructor as soon as they are able, and must submit documentation to the Dean of Students Office. Once the instructor is satisfied with the validity of the documentation, a make-up exam will be scheduled after a reasonable amount of time, i.e., before the end of the semester. If the student's documentation is deemed insufficient to excuse the absence, a score of *zero* will be assigned for the missed exam. Exams missed without any documentation will be assigned a score of *zero*.

Exam Regrades: Exams will be scanned and subsequently graded using the Gradescope platform. If you believe that you have found a grading error, you will be able to submit regrade requests for individual exam questions in Gradescope within a week of the respective exam scores being posted to Canvas. Questions regarding grades/grading are not accepted by email or Canvas message. The regrade request period for the final exam may be shortened; details will be communicated to the class.

Other Information and Policies

Practice Problems: Practice problems will be assigned from the questions at the end of each chapter (EOC) and instructor worksheets. These homework assignments will not be collected or graded. However, completion and understanding of the practice problems will be of critical importance to succeeding in this course. Do not turn to the solutions manual immediately! Understanding a given solution does not teach you any problem-solving skills. Keep up with the course and you will be in good shape. Try and allow at least 2 hours **per day** (6 days a week) to study, work the problems and read the book chapters.

Questions? Just Ask! This term we will be using *Piazza* for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, TAs, and instructors. You can even ask questions anonymously! Do not send questions *via* email or Canvas message. If you have any problems or feedback for the developers, email team@piazza.com. You can find a link to our Piazza class page on the e-Learning website.

Contacting the Instructor/Office Hours: Canvas messages are for administrative purposes only, and *not for distance-instruction*. All academic inquiries must be made during office hours or on Piazza (see above). Be prepared before attending office hours, bring specific questions and your previous work. Questions about grades will not be discussed during office hours due to privacy regulations.

For private or grade-related questions, direct your questions directly to the instructor using the Canvas message function. **Do not email outside of Canvas to your instructor's email**; you will be asked to resend the query through Canvas.

Attendance and Classroom Etiquette: Although attendance will not be taken, students are expected to come to class and be there on time. Please be respectful of others and adjust your cell phone so that it does not ring during class. If you arrive late on exam days you will not be given additional time.

Advising Issues: Visit or contact one of the chemistry undergraduate advisors.

Website: https://www.chem.ufl.edu/undergraduate/advising/

Email: advising@chem.ufl.edu

Need to drop this course? You can do so by logging in to ONE.UF and selecting "After Deadline – Add/Drop Classes" under Registration in the main menu. If you have questions or need help with this process, please reach out to the advising office in your college.

Accommodations for Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://disability.ufl.edu/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodations. It is the responsibility of the student to adhere to the DRC's deadlines when submitting accommodated test requests (ATRs) in order to receive testing accommodations.

U Matter, We Care: Your well-being is important to the University of Florida. The U Matter, We Care initiative (http://www.umatter.ufl.edu/) is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Faculty Evaluations: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Copyright Notice: All handouts used in this course are copyrighted and may not be copied without the instructors’ expressly granted permission. ‘Handouts’ include all materials generated for this class, which include but are not limited to syllabi, exams, problems, in-class materials, review sheets, problem sets, or other materials. Tutors and tutoring services are expressly forbidden from copying any or all of these materials without prior written permission. Only students currently enrolled in the class may make a single copy of this material for their personal use.

The UF Student Honor Code

UF students are bound by The Honor Pledge which states:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the 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, but are not limited to, copying on an exam (or helping another student to copy), submitting someone else's work as your own, having another person complete assignments for you, and unauthorized collaboration.

Any student found responsible for an academic honesty violation will receive a zero (0) for the compromised exam or assignment.

The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read both the Honor Code and the Conduct Code. If you have any questions or concerns, please consult with the instructor.

Tentative Course Schedule – Class #21885 (T6, R6-7)

Date	Chapter: Topics
T, 1/9	12: introduction to infrared spectroscopy
R, 1/11	12: interpreting infrared spectra
	13: introduction to proton (^{1}H) NMR, equivalent hydrogens, signal areas (integrals)
T, 1/16	13: chemical shift, signal splitting (multiplicity), the coupling constant *J*
R, 1/18	13: complex splitting patterns, carbon (^{13}C) NMR, solving combined spectral problems
	15: organometallic compound structure, preparation, acid/base properties, and reactions
T, 1/23	15: Gilman reagents, carbenes and carbenoids
R, 1/25*****	review/practice
M, 1/29	**Exam 1 (Chapters 12, 13, 15)**
T, 1/30	16: aldehyde/ketone structure and nomenclature, reaction with carbon nucleophiles
R, 2/1	16: reaction with carbon nucleophiles (cont'd), Wittig reaction, Horner-Wadsworth-Emmons reaction
	16: addition of oxygen nucleophiles: carbonyl hydrates, hemiacetals, and acetals
T, 2/6	16: acetals protecting groups; nitrogen nucleophiles: imines and enamines, oxidation of aldehydes
R, 2/8	16: oxidation and reduction, acidity of α-hydrogens, keto-enol tautomerism, reactions at an α-carbon
	17: carboxylic acid structure and nomenclature, acidity, preparation, and reduction
T, 2/13	17: esterification of carboxylic acids, conversion to acid chlorides, decarboxylation
R, 2/15	18: carboxylic acid derivatives: structure, nomenclature, relative reactivities
	18: reaction with water (hydrolysis) and alcohols
T, 2/20	18: synthesis examples
R, 2/22*****	review/practice
M, 2/26	**Exam 2 (Chapters 16-18.5)**
T, 2/27	18: reaction with ammonia and amines, carboxylate anions, and organometallic reagents
R, 2/29	18: reduction of carboxylic acid derivatives
	18: synthesis examples
T, 3/5	19: formation and reactions of enolate anions, acidity of α-hydrogens, aldol reaction
R, 3/7	19: crossed and intramolecular aldol reactions, Henry reaction
	19: Claisen and Dieckmann condensations, hydrolysis, and decarboxylation of β-ketoesters
	Spring Break (3/11-3/15)
T, 3/19	19: alkylation and acylation of enamines, acetoacetic & malonic ester synthesis
R, 3/21	19: conjugate addition to *α*,*β*-unsaturated carbonyl compounds, Stork enamine synthesis
	19: Robinson annulation, crossed enolate reactions using LDA
T, 3/26	20: conjugated dienes: stability, π-molecular orbitals, and electrophilic addition
R, 3/28*****	review/practice
F, 3/29	**Exam 3 (Chapters 18.6-20.2)**
T, 4/2	20: pericyclic reaction theory, Diels-Alder reaction: diene conformation, endo rule
R, 4/4	20: Diels-Alder reaction: dienophile configuration, diene configuration, regioselectivity, examples
	21: aromaticity, examples of aromatic molecules/ions
T, 4/9	21: π-MOs of cyclic conjugated systems, nomenclature of benzene derivatives
R, 4/11	22: reactions at a benzylic position, electrophilic aromatic substitution (EAS)
	22: EAS (cont'd), substituent effects (directing and activating/deactivating) on EAS
T, 4/16	22: nucleophilic aromatic substitution, synthesis examples
R, 4/18*****	review/practice
R, 4/18	**Exam 4 (Chapters 20-22)**
T, 4/23†	23: amine structure, nomenclature, basicity, and preparation (in class)
	23: amine preparation (cont'd), reaction with HNO_2, Hofmann and Cope eliminations (recording)
M, 4/29	**Cumulative Final Exam (Chapters 12, 13, 15–23) – 7:30–9:30 AM**

*****no class during 6th period

†watch recording of 2nd part from TTR section

Tentative Course Schedule Class #21886 (T7-8, R8)

Date	Chapter: Topics
T, 1/9	12: introduction to infrared spectroscopy
	12: interpreting infrared spectra
R, 1/11	13: introduction to proton (^{1}H) NMR, equivalent hydrogens, signal areas (integrals)
T, 1/16	13: chemical shift, signal splitting (multiplicity), the coupling constant *J*
	13: complex splitting patterns, carbon (^{13}C) NMR, solving combined spectral problems
R, 1/18	15: organometallic compound structure, preparation, acid/base properties, and reactions
T, 1/23*****	15: Gilman reagents, carbenes and carbenoids
R, 1/25	review/practice
M, 1/29	**Exam 1 (Chapters 12, 13, 15)**
T, 1/30	16: aldehyde/ketone structure and nomenclature, reaction with carbon nucleophiles
	16: reaction with carbon nucleophiles (cont'd), Wittig reaction, Horner-Wadsworth-Emmons reaction
R, 2/1	16: addition of oxygen nucleophiles: carbonyl hydrates, hemiacetals, and acetals
T, 2/6	16: acetals protecting groups; nitrogen nucleophiles: imines and enamines, oxidation of aldehydes
	16: oxidation and reduction, acidity of α-hydrogens, keto-enol tautomerism, reactions at an α-carbon
R, 2/8	17: carboxylic acid structure and nomenclature, acidity, preparation, and reduction
T, 2/13	17: esterification of carboxylic acids, conversion to acid chlorides, decarboxylation
	18: carboxylic acid derivatives: structure, nomenclature, relative reactivities
R, 2/15	18: reaction with water (hydrolysis) and alcohols
T, 2/20*****	18: synthesis examples
R, 2/22	review/practice
M, 2/26	**Exam 2 (Chapters 16-18.5)**
T, 2/27	18: reaction with ammonia and amines, carboxylate anions, and organometallic reagents
	18: reduction of carboxylic acid derivatives
R, 2/29	18: synthesis examples
T, 3/5	19: formation and reactions of enolate anions, acidity of α-hydrogens, aldol reaction
	19: crossed and intramolecular aldol reactions, Henry reaction
R, 3/7	19: Claisen and Dieckmann condensations, hydrolysis, and decarboxylation of β-ketoesters
	Spring Break (3/11-3/15)
T, 3/19	19: alkylation and acylation of enamines, acetoacetic & malonic ester synthesis
	19: conjugate addition to *α,β*-unsaturated carbonyl compounds, Stork enamine synthesis
R, 3/21	19: Robinson annulation, crossed enolate reactions using LDA
T, 3/26*****	20: conjugated dienes: stability, π-molecular orbitals, and electrophilic addition
R, 3/28	review/practice
F, 3/29	**Exam 3 (Chapters 18.6-20.2)**
T, 4/2	20: pericyclic reaction theory, Diels-Alder reaction: diene conformation, endo rule
	20: Diels-Alder reaction: dienophile configuration, diene configuration, regioselectivity, examples
R, 4/4	21: aromaticity, examples of aromatic molecules/ions
T, 4/9	21: π-MOs of cyclic conjugated systems, nomenclature of benzene derivatives
	22: reactions at a benzylic position, electrophilic aromatic substitution (EAS)
R, 4/11	22: EAS (cont'd), substituent effects (directing and activating/deactivating) on EAS
T, 4/16	22: nucleophilic aromatic substitution, synthesis examples
	review/practice
R, 4/18	**Exam 4 (Chapters 20-22) – no class**
T, 4/23	23: amine structure, nomenclature, basicity, and preparation
	23: amine preparation (cont'd), reaction with HNO_2, Hofmann and Cope eliminations
M, 4/29	**Cumulative Final Exam (Chapters 12, 13, 15–23) – 7:30–9:30 AM**

*****no class during 8th period