

CHEM 2301
Organic Chemistry I
Section 003

M W F 1:25 – 2:15 pm
220 Bruininks Hall

Instructor: Professor Ian Tonks
Office: 568A Kolthoff Hall
Phone: 612.624.4705
Email: itonks@umn.edu
Website: Moodle
Office Hours: Weds 2:30-3:30 pm; Thurs 4:00-5:00 pm (or by appointment if necessary)

MPACT

Scholar:

Course Materials: J. G. Smith, *Organic Chemistry* (4th edition)
(Required) McGraw Hill ConnectPlus subscription (comes with Smith)
Modeling Kit (Bookstore)
iClicker2 (Bookstore) OR Smartphone REEF poller (\$\$ subscription)

Course Materials: Solutions manual for *Smith*
(HIGHLY RECOMMENDED) D. Klein, *Organic Chemistry as a Second Language: First Semester Topics* (3rd ed.)
D. P. Weeks, *Pushing Electrons*

Coverage: The goal of this course is to provide a general introduction to organic chemistry. We will be covering the first 15 chapters of Smith, approximately 580 pages of the textbook.

Email Policy: All CHEM 2301 emails must start with [CHEM 2301] in the title.

I receive upwards of 100 (work-relevant) emails a day. Additionally, I am teaching *two* classes this semester, and as a result it is very important that I can quickly sort your email into the appropriate mental bin. I will do my best to respond to class-related emails within 24 hours of receiving them, however, keep in mind that during high volume times (near exams) this may not be possible. Please try not to wait until the last minute to ask questions via email. Please do not email me with questions that can be answered in tutor hours or by properly reading the syllabus. My email answering time is 10:00 am to 10:00 pm M-F.

COURSE STRUCTURE AND GRADING EXPLANATION:

In-class exams: 600 Points (200 each)

In-class clicker participation: 50 Points (completion; 80% clicker points = perfect score)

LearnSmart online modules: 50 Points (% completion * 50 points; e.g. 98% -> 49)

Final exam: 350 Points

Exams: Three 50-minute exams will be given in-class throughout the semester, not including the final exam. These exams will be closed-book, and notes, model kits, calculators and mobile electronic devices will not be allowed. Your student ID must be presented to the proctor when you turn in the exam. **Students will be split in to multiple classrooms for exams:** Room assignments for the semester will be given out before the first exam.

Exam 1: In class, Friday February 17 2017.

Exam 2: In class, Friday March 24 2017.

Exam 3: In class, Friday April 14 2017.

Final Exam: Wednesday May 10 1:30 – 3:30 pm Room TBD

Clicker Participation: We will be doing various types of clicker questions in class. These questions will be graded for participation, not correctness. If you answer 80% of the clicker questions over the course of the semester, you will earn the full 50 possible points. The 20% buffer is designed to account for days where students forget their clickers, are sick, run out of batteries, etc. etc. You must register your iClicker or REEF poller with Moodle to receive full credit: instructions can be found at <http://z.umn.edu/iclickerstudent>. The deadline to register your iClicker is the end of the add-drop period. Our clicker class frequency is AA.

McGraw Hill LearnSmart: Through completion of the online LearnSmart adaptive learning modules *before their due date on the website*, you can earn 50 points on your final grade in the class. This is incentive for you to *read the book and be up to date on the material* before coming to class. LearnSmart due dates are posted online. You will need to enter an access code for McGraw Hill Connect, which comes with your textbook. You can access Connect and LearnSmart via Moodle.

Homework: Extra practice homework problems will be posted online through Moodle and ConnectPlus so that you can work problems online and get immediate “right/wrong” feedback. However, in addition to this it is **HIGHLY RECOMMENDED** that you work the book problems for the chapters suggested in the course outline. Some suggested book problems will be given in class. Some exam questions may be directly taken from the book/online problems (hint hint).

USEFUL STUFF:

Tutor Hours: Organic tutor hours will be held in Smith 124 throughout the semester beginning January 23rd according to the schedule posted on the door and my website. It is important to me that your time is well spent in this room. Please inform me or the Head Organic TA (Juntian Zhang, zhan3275@umn.edu) if tutors are not present at their scheduled time, helpful, or leave for extended periods of time. A reminder that the purpose of a tutor is to help you learn, not simply give you answers to questions or problems. The tutors are instructed, in fact, to ask YOU questions that will help you understand what concept you are missing that is preventing you from solving a particular problem. Self-discovery will enhance the depth and retention of your knowledge.

ChemFoundations Program: Another optional study group program is ChemFoundations. This program involves the volunteer efforts of advanced undergraduate/graduate students (the ChemFoundations Leader) who enjoy teaching and helping students to succeed in organic chemistry. Each ChemFoundations leader will meet at a designated time and place once a week with students to work problems and review difficult concepts. It is designed to be a one-hour to one and a half hour active-learning session; not a lecture, office hour, or private tutoring session. So please attend only if you are willing to participate and engage in group learning. You are free to "try-out" the different leaders and select one or more that best fits your learning style. Session information will be given the first week of classes and the Organic Chemfoundations program will start September 14th. For questions or problems, please contact Jake Brutman (brutm003@umn.edu) or Professor Jane Wissinger (jwiss@umn.edu).

LEGAL STUFF:

Policy on Additional Time or Special Needs for Exams: If you have a documented condition that allows additional time for exams or need other special assistance, you are responsible for contacting with Disability Services (<http://ds.umn.edu/>) immediately and schedule to take your exams with a proctor at their office. You need to schedule these well in advance: exam dates are above, so get started right away. Prof. Tonks and the proctors are NOT responsible for students who fail to adequately prepare to use or schedule use of disability services. Neither the TAs nor I are certified to proctor exams for students with additional needs. If you do not prepare adequately, you'll be treated like everyone else – no exceptions.

Policy on Re-grades: 1) To qualify for a re-grade, you must take the exam in ink and *not* use white-out. 2) Re-grades must be submitted 48 hours after the exams are handed back. 3) If you want a re-grade, you must submit *in writing* your argument for what you feel was graded incorrectly. Feel free to draw pictures and refer to the class textbooks, handouts, or notes. If you do refer to the textbook or solution guide, give the relevant pages. 4) I reserve the right to re-grade the entire exam if you ask for a re-grade. One exception to all of the above: If an arithmetic error in your point tally has occurred, affix a cover note with the words “tally error” on it and the re-grade will be accepted as is.

Scholastic Dishonesty: Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course or a “Zero” for a quiz/exam. At a minimum, if a proctor or I have sufficient evidence for academic dishonesty, I will present that evidence to the Office for Student Academic Integrity and the college the student is enrolled. (<http://www1.umn.edu/oscai/>) If you have any questions regarding the expectations for a specific assignment or exam, ask.

Policy on “I” Grade: Departmental policy is that a student may request an Incomplete grade only when (a) he or she has a University-sanctioned excuse for missing the final exam and (b) he or she is passing the course based on all other graded components. Assignment of an I requires that the instructor and student sign a contract, available in the Departmental undergraduate office, stipulating the procedure by which the I grade will be made up (e.g., taking a final exam from another instructor in the next semester). Failure to successfully complete the procedure outlined in the contract will result in the I being administratively changed by the University Registrar.

Make Up Work for Legitimate Absences: Selected from the Administrative Policy for Legitimate Absences:

- 1) “Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include illness of the student or his or her dependent, participation in intercollegiate athletic events (see the Administrative Policy: *Intercollegiate Athletic Events during Study Day and Finals Weeks: Twin Cities*, which prohibits intercollegiate athletic competition during study day and finals week except under certain circumstances), subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances also include activities

sponsored by the University if identified by the senior academic officer for the campus or his or her designee as the basis for excused absences. The instructor has the right to request verification for absences. Such circumstances do not include voting in local, state, or national elections.”

- . 2) “It is the responsibility of students to plan their schedules to avoid excessive conflict with course requirements.”
- . 3) “A student must notify instructors of circumstances identified in (1) as soon as possible and provide documentation requested by the instructor.”
- . 4) “If a student is absent due to circumstances identified in (1) and has complied with the notification requirement, the instructor may not penalize the student and must provide reasonable and timely accommodation or opportunity to make up exams or other course requirements that have an impact on the course grade.”
- . 5) “The instructor has primary responsibility to decide if an absence is due to unavoidable or legitimate circumstances.”
- . 6) “Instructors are expected to accommodate students who wish to participate in party caucuses”
- . 7) “This policy applies to all course requirements, including any final examination.”
- . 8) “Colleges and academic units may establish specific criteria for notice and completion of work to implement this policy.”

If the above conditions are met:

Missed Exams Due to Legitimate Absences: Student(s) missing the exam and I will find a date and time as close as possible to the exam time to take a make-up exam. Nights and weekends will be considered. The questions on the make up exam will *not* be identical to the in-class exam, for obvious reasons.

Student athletes should inform me ASAP of all potential conflicts for exams. I do not allow student athletes to take a proctored exam while traveling, they have to take the make-up on campus.

All make-up exams will be scheduled *prior* to the normal exam date. Students who miss exams will be handled by a situational basis.

Approximate Course Schedule (LearnSmart Due in RED):

Class	Date	Topics	Reading for Class
1	1/18	Course Introduction	
2	1/20	Lewis structures, formal charge, resonance and curved arrow formalism.	Prologue; Ch 1.1-1.6; back cover table.
3	1/23	Molecular shapes, drawing organic structures, electronegativity and bond polarization	Ch 1.7-1.14.
4	1/25	Brønsted acids and bases; Lewis acids and bases	Ch 2.1-2.6; 2.8.
5	1/27	Acids and bases continued, practice with curved arrows	
6	1/30	Functional groups and physical properties	Ch 3.1-3.4; 3.8.
7	2/1	Alkanes: structure and conformations	Ch 4.1-4.2; 4.8-4.10
8	2/3	Conformations of substituted cyclohexanes; Intro to oxidation.	Ch 4.11-4.14
9	2/6	Nomenclature: learning how to decipher the ingredients in food and other items.	Ch. 4.3-4.6; 7.2; 9.3; 10.3A&C; 11.2
10	2/8	Isomers, stereochemistry, chirality and stereogenic centers.	Ch. 5.1-5.5
11	2/10	<i>R</i> & <i>S</i> descriptors, <i>E</i> & <i>Z</i> descriptors, introduction to diastereomers, meso compounds.	Ch. 5.6-5.9; 10.3B.
12	2/13	Diastereomers, disubstituted cycloalkanes, physical properties of stereoisomers	Ch. 5.10-5.13
13	2/15	Catch up and review	
EXAM	2/17	Coverage: All of Chapters 1-5; 7.2; 9.3; 10.3; 11.2	
14	2/20	Reactive intermediates in organic chemistry	Ch. 6.1-6.4
15	2/22	Energy diagrams, thermodynamics and kinetics	Ch. 6.5-6.10
16	2/24	More energy diagrams, introduction to nucleophilic substitution: S_N2 reaction, S_N1 reaction, S_N1 vs. S_N2 .	Ch. 7.1; 7.5-7.13
17	2/27	More nucleophilic substitution, introduction to synthesis problems.	Ch. 7.14-7.19
18	3/1	Elimination reactions: $E1$ & $E2$, $E1$ vs. $E2$; alkyne synthesis.	Ch. 8.1-8.11
19	3/3	Predicting substitutions and eliminations; predicting and drawing the mechanism (Summary of Chs. 7&8)	
20	3/6	Predicting and drawing the mechanism (Summary of Chs. 7 & 8)	
21	3/8	Synthesis of alcohols, ethers and epoxides; dehydration of alcohols/carbocation rearrangements	Ch. 9.1-9.2; 9.4-9.10

22	3/10	More reactions of alcohols and ethers	Ch. 9.11-9.14
23	3/20	Reactions of ethers and epoxides	Ch. 9.14-9.17
24	3/22	Catch up and review	
EXAM	3/24	Coverage: All of Chapters 6-9.	
25	3/27	Introduction to alkenes, Markovnikov's rule	Ch. 10.1-10.2; 10.3-10.10
26	3/29	Stereochemistry in additions to alkenes; Triangle mechanisms; Halogenation; Halohydrin formation; hydroboration/oxidation.	Ch. 10.11-10.16
27	3/31	Organic synthesis and making molecules that require more than one reaction; organizing reactions into meaningful categories	Ch 10.17-10.18
28	4/3	Introduction to alkynes: additions to alkynes, enol tautomers.	Ch. 11.1; 11.3-11.10
29	4/5	Alkynes continued: reactions of alkyne anions, retrosynthetic analysis of reactions in Ch. 11	Ch. 11.11-11.12
30	4/7	Reductions, hydrogenations of alkenes and alkynes.	Ch. 12.1-12.6
31	4/10	Oxidations, ozonolysis, epoxidation, dihydroxylation, oxidation of alcohols	Ch. 12.7-12.15
32	4/12	Summary of Ch. 12, multistep synthesis problem solving	
EXAM	4/14	Coverage: Chapters 10-12	
33	4/17	Introduction to radicals, half-arrow notation, resonance with radicals, halogenation of alkanes	Ch. 15.1-15.8
34	4/19	Allylic halogenation, addition of radicals to alkenes, intro to polymers	Ch. 15.10; 15.13; 15.14
35	4/21	Mass spectrometry and infrared spectroscopy	Ch. 13
36	4/24	Introduction to NMR	Ch. 14
37	4/26	NMR continued	
38	4/28	Interpreting NMR spectra	
39	5/1	IDing chemicals by combining all forms of spectroscopy/spectrometry	
40	5/3	More IDing chemicals	
41	5/5	Catchup and review	
FINAL	5/10	Coverage: COMPREHENSIVE!	