

ORGANIC CHEMISTRY I SYLLABUS, FALL 2018

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<http://tinyurl.com/BJMofficehours>



Office Hours: Mon. 11–1; Wed. and Fri. 10–12; Open door, or by appt. See the link to my office hours on my website above because some variation will occur including additional hours.

Catalog info: Organic Chemistry I (CHEM 2511.03) is a 3-credit hour course that fulfills a scientific literacy distribution requirement.

Text & Equip:

- 1) *Organic Chemistry*, 3rd Edition by David R. Klein (Binder ready **OR** Hardback)
- 2) Student Study Guide to the text above **is recommended**. It is on reserve in the ONU Library.
- 3) The Wiley Plus Access-homework system (see below)
- 4) A Molecular Model kit like Molecular Visions: ISBN 9780964883710

A package containing Wiley Plus Access, a loose-leaf version of the textbook and a loose-leaf version of the Student Study Guide/Solutions Manual with ISBN 9781119380719 is available in the ONU bookstore for \$240.00. The WileyPlus standalone code is \$126.00

Lecture: 1–1:50 MWF in Mathile 247

Prerequisites: You must have completed CHEM 1721 or 1821 with a passing grade to enroll in this course.

Course goals: The course is designed so that the student can develop a basic understanding of organic chemistry structures and reactions thereby laying a foundation for further study in the field and closely related disciplines (e.g. biochemistry, molecular biology, and pharmaceutically relevant sciences).

Point Breakdown:

3 exams, @ 140 points	420
5 quizzes, @ 40 points	200
Online Homework	130
Bonus	??
Final exam	250
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TOTAL 1000 POINTS

Grade Scale:

>870	A
869–760	B
759–650	C
649–580	D

Quizzes & Exams:

There will be five 40-point quizzes given during the semester. Each quiz will last 15-25 minutes and will cover the most recent material presented in lecture. There will be three 140-point, Tuesday evening exams (7:00–8 PM) and a 250-point final exam. The exams will cover everything from the first day of class with an emphasis on the material covered since the previous exam. The final exam will be cumulative for the semester with 200 points of multiple-choice and the rest short answer.

Class Schedule, Organic Chemistry I:*

Date	Topic	Reading
08/20 M	Intro, Structural Theory of Matter, Lewis Structures, Formal Charges, Covalent Bonds	1.1–1.5
08/22 W	Atomic Orbitals, Valence Bond Theory, Molecular Orbital Theory, Hybridization	1.6–1.9
08/24 F	VSEPR, Dipole Moments, Intermolecular Forces, Physical Properties, Solubility	1.10–1.13
08/27 M	Molecular Representations, Line-Bond Structures, Functional Groups	2.1–2.3
08/29 W	Formal Charges, Lone Pairs, 3-D, Resonance, Curved Arrows	2.4–2.8
08/31 F	Resonance	2.9–2.13
09/03 M	Labor Day – No Class	
09/05 W	Quiz 1 Brønsted-Lowry Acids and Bases, pKa, Equilibrium Review, Curved Arrows	3.1–3.4
09/07 F	Equilibrium, Choice of Reagents, Solvating Effects, Counter ions, Lewis Definition	3.5–3.9
09/10 M	Alkanes, Nomenclature, Constitutional Isomers	4.1–4.3
09/12 W	Stability, Sources and uses of Alkanes, Newman Projections & Conformational Analysis	4.4–4.8
09/14 F	Cycloalkanes, Conformational Analysis of Cycloalkanes	4.9–4.10
09/17 M	Quiz 2 Chair Conformations, Sub. Cycloalkanes, <i>Cis-trans</i> Stereoisomers, Polycyclic Systems	4.11–4.15
09/19 W	Isomerism, Stereoisomerism	5.1–5.2
09/21 F	Absolute Configuration, Cahn-Ingold-Prelog, Optical Activity	5.3–5.5
09/24 M	Enantiomers and Diastereomers, Symmetry and Chirality	5.6–5.8
09/26 W	Quiz 3 Fisher Projections, Conformationally Mobile Systems, Resolution of Enantiomers	5.9–5.11
09/28 F	Thermodynamics, Equilibrium, Kinetics	6.1–6.5
10/01 M	Exam 1 (In class)	
10/03 W	Energy Diagrams, Nucleophiles, Electrophiles, Mechanisms, Arrow Pushing, Rearrangements	6.6–6.12
10/05 F	Substitution Reactions, Alkyl Halides, S _N 2 Mechanism	7.1–7.3
10/08 M	Fall Break – No Class	
10/10 W	S _N 1 Mechanism, Drawing the Complete Mechanisms	7.4–7.6
10/12 F	Determining which Mechanism Predominates, Choosing Reagents	7.7–7.9
10/15 M	Elimination, Alkenes, Nomenclature, Stereoisomers of Alkenes, Stability of Alkenes	7.10–7.11
10/17 W	E1, E1cB, E2 Mechanisms	7.11–7.12
10/19 F	Quiz 4 Synthesis strategies	7.13
10/22 M	Addition Rxns, Addition vs. Elimination	8.1–8.2
10/24 W	Hydrohalogenation, Acid-Catalyzed Hydration, Oxymercuration-Demercuration	8.3–8.5
10/26 F	Hydroboration-Oxidation, Catalytic Hydrogenation, Halogenation	8.6–8.9
10/29 M	Dihydroxylation, Oxidative Cleavage, Synthesis Strategies, Alkyne Nomenclature	8.10–8.14
10/30 T*	Exam 2*	
10/31 W	Intro., Spectroscopy, Using Molecular Formulae (MF) (14.16), UV Spectra and Conjugation	14.1–5, 16.11–13
11/02 F	Infrared Spectroscopy	14.6–14.7
11/05 M	IR (cont.), Intro. NMR Spectroscopy, ¹³ C NMR, Chemical Shift	15.1–5, 12–.13
11/07 W	Theory, Terminology, Origin of Chemical Shift	15.6
11/09 F	¹ H NMR: Chemical Shift, Integration, 1st Order Splitting (the n+1 Rule)	15.7–10
11/12 M	¹ H NMR: Splitting (cont.) and Examples	15.7–10
11/14 W	Mass Spectroscopy and Determining MF	14.8–14.11
11/16 F	Bonus Worksheet Due. MS Fragmentation, Solving Structure Problems	14.12–14.16
11/19 M	Thanksgiving Break – No Class	
11/21 W	Thanksgiving Break – No Class	
11/23 F	Thanksgiving Break – No Class	
11/26 M	Problem-Answer Session	
11/27 T*	Exam 3*	
11/28 W	Alkynes, Acidity of Alkynes, Addition to Alkynes, Ozonolysis, Alkylation of Alkynes, Synthesis	9.1–9.8
12/30 F	Alkynes (cont), Radicals, Radical Mechanisms, Halogenation, Thermodynamics, Selectivity,	9.9–9.11
12/03 M	Radicals Mechanisms, Halogenation, Thermodyn., Selectivity, Stereochem., Allylic Bromination	10.1–10.7
12/05 W	Quiz 5 Radical Addition of HBr, Radical Polymerization, Synthesis	10.8–10.13
12/07 F	Review	
12/11 T	Final Exam (7–9 PM) Room TBA	

Please note this is a best guess estimate of the lecture content for a give date. *Tuesday evening time blocks (7:00-7:50 PM) are designated for exams.

Bonus:

There will be a bonus (points TBA) for correctly completing a spectroscopy bonus problem set.

Withdraws:

If you need to withdraw from the Organic I laboratory course (CHEM 2551 or 2651), you must also withdraw from this course, since you will not receive credit for this co-requisite course.

Incompletes:

Incompletes will be given only when the work of the course is substantially completed and when the student's work is of passing quality.

Academic Misconduct:

The University expects its students to conduct themselves in a dignified and honorable manner as mature members of the academic community and assumes that individually and collectively they will discourage acts of academic dishonesty. The University also expects cooperation among administrators, faculty, staff, and students in preventing acts of academic dishonesty, in detecting such acts, reporting them, and identifying those who commit them, and in providing appropriate punishment for offenders. The University Code of Academic Student Conduct is found in Appendix C of the Student Handbook: http://www.onu.edu/student_life/student_conduct/student_handbook To this end, any student deviating from these standards in this course will be penalized to the fullest extent possible.

Special accommodations policy:

Students requiring accommodations because of physical and/or learning disabilities should contact their Dean's office prior to or during the first week of classes. The student needs to initiate a discussion of classroom/testing procedure accommodations with the instructor at minimum of **3 days in advance of each exam/quiz**. For more information, see: http://onu.edu/student_life/disability_services

Online Homework (WileyPlus System)

We will be using the WileyPlus system for our online homework. It will be graded. We will multiply your percent correct times 130 to get the score for the course.

1. Go to <http://www.wileyplus.com/class/645025> or click on the link at <http://tinyurl.com/onuorganic>
2. Click on Create Account. And Agree to the terms.
3. Enter your code if you purchased one at the Bookstore or order the package that you want. You need WileyPlus instant access.
4. Follow the on-screen directions.
5. For technical issues see: wileyplus.com/support.

Assignments	Due Date
Ch. 1	08/28 (T)
Ch. 2 & MS	09/04 (T)
Ch. 3	09/11 (T)
Ch. 4	09/20 (R)
Ch. 5	09/27 (R)
Ch. 6	10/04 (R)
Ch. 7	10/18 (R)
Ch. 8	10/28 (Su)
Ch. 15 & 16	11/26 (M)
Ch. 9	12/03 (M)
Ch. 10	12/07 (F)

Makeups:

In the event that you feel that you will be unable to attend a scheduled exam/quiz, you must contact me prior to (or as soon as safely feasibly) to discuss your situation (by phone **AND** email). If an excused absence is granted by the instructor, the instructor reserves the right to 1) provide a makeup exam that contains questions covering material up to the day of the makeup exam, 2) administer a cumulative makeup exam at the end of term, 3) prorate the final, or 4) use other means of evaluation that are agreeable between the instructor and the student. The instructor reserves the right to choose the method of makeup, which will generally be in the form of option #3. Unexcused absences including (but not limited to): sleeping through the exam, not informing the instructor in a timely fashion, and vacation travel will result in the score of zero. Departmental policy dictates that makeup exams will not be given to students before the class has taken the exam.

Title IX Information:

Ohio Northern University does not discriminate or tolerate discrimination on the basis of sex, gender, or gender identity in its educational, extracurricular, or athletic programs, or in any admission or employment decisions. ONU is committed to promptly and equitably responding to all reports of sexual discrimination with the goal of eliminating the misconduct and/or harassment, preventing its recurrence, and addressing its effects on any individual or the community.

Suggestions:

Your textbook is your primary learning resource. Read the assigned chapters prior to attending class. In class, I will stress the most important points and clarify difficult material. Lectures will not necessarily cover all the required material, and all the material covered in class will not necessarily be covered in the text. Thus, it is very important that you read the text and attend lecture.

Organic chemistry is a cumulative subject: understanding the new material requires that you have mastered earlier material. Therefore, it is extremely important that you keep up with the reading. It is strongly recommended that you read the assigned chapters prior to attending the lecture on the topic.

Work the assigned problems! You cannot learn organic chemistry without doing practice problems. You are responsible for every problem in the text. Make certain that you understand the problem instead of just being able to reproduce the solution. While working problems, it is strongly suggested that you refer back to the text and reread sections of the previous chapters to find the information you need to answer the question. You should only use the solutions manual to check problems, not to learn how to do the problems. Some students find it helpful to write up the problem set as if they are going to turn it in to the instructor. Do a couple problems each day.

Although memorization of some key subject matter is required, it is necessary to learn concepts and apply them to the task at hand. Do not confuse having memorized class material (or solutions to a particular problem) as having learned the concepts. Understanding implies application of the information that you have acquired to solve new problems.

Studying in small groups (2-3 people) can be very beneficial and is strongly recommended, but do not do the majority of your studying for this course in groups. The most effective way to study with a group is to discuss the issues with which you are having the most difficulty.

If you are having difficulty with this course, come to see me ASAP. If you do not know where to start asking questions, the question that needs answered is "When can I get in to see my instructor?"

Using cell phones in class is disruptive, do not use them during lecture.