

# ORGANIC CHEMISTRY I (CHEM 231) – SPRING 2018

This syllabus subject to change pending notification verbally in class or via the email list.

*MWF 8:10 – 9:00 & 9:10 – 10:00 am, Hayes 109*

*Prof. Yutan Getzler*

*Office:* Tomsich Hall 308  
*Office hours:* Mon & Wed, 11 am – 1 pm; Thurs, 10 – 11 am, or by appointment  
*PBX:* 5304  
*email:* getzlery  
*website:* <http://chemistry.kenyon.edu/faculty/getzler.htm>, Moodle

**Required:** Vollhardt, K. Peter C.; Schore, Neil E. Organic Chemistry: Structure and Function, 6e  
HGS Molecular Structure Model Kit (same as used in CHEM 12X sequence)

**Recommended:** Schore, Neil E. Study Guide and Solutions Manual for Organic Chemistry, 5<sup>th</sup> edition

## Point Distribution:

3 Midterm Exams @ 100 points each	300
Final Exam	200
Quizzes	100
<u>Engagement &amp; participation</u>	<u>80</u>
Total	680

## Exam Schedule:

<u>Exam</u>	<u>New Chapters</u>	<u>Date &amp; Time</u>
Exam I	1, 2, 10	Mon, Feb. 12 <sup>th</sup>
Exam II	3, 4, 5, & 6	Fri, Mar. 30 <sup>th</sup>
Exam III	7, 8, & 9	Fri, Apr. 27 <sup>th</sup>
Final	Thurs., May 10, 6:30 pm (231.01)	Thursday, May 10, 8:30 am (231.02)

**Academic Honesty:** “Kenyon College is, at the core, an intellectual community of scholars – students and faculty – engaged in the free and open exchange of ideas. Critical to this lively exchange and deep engagement with ideas is the academic integrity of our work, both inside and outside the classroom.” In short, all materials submitted for credit must be your own work ([tinyurl.com/KC-Acad-Integ](http://tinyurl.com/KC-Acad-Integ)). I hold you responsible for ensuring each other’s honesty; if you know of a violation, please relay your concerns to myself or the Dean of Students.

**Goals:** This course can change the way you think of the physical world. Chemistry 231 provides a foundation for other courses at Kenyon, including Organic Chemistry II (Chem 232), Advanced Organic Chemistry (Chem 401), Biochemistry (Chem 256), Advanced Biochemistry (Chem 401), and Genomics (Bio 263). By the end of the two-semester sequence, you will better understand current organic chemistry research.

**Attendance:** The material you will be expected to know for this course continuously builds on itself. It is quite easy to get behind if you miss a topic. I do not take formal attendance but am likely to note your absence – we have small classes at Kenyon! Absence from a scheduled exam will only be excused if you are declared infirm by the College Health and Counseling Center, or due to compelling and unavoidable personal circumstances as determined by the Dean of Students or the Dean for Academic Advising.

If you choose to participate in varsity athletics, note the college policy on attendance in the *Scheduling Guidelines for Athletic Contests* ([http://documents.kenyon.edu/provost/cas\\_athlet\\_sched.doc](http://documents.kenyon.edu/provost/cas_athlet_sched.doc)). By the end of the first week, notify me of all potential conflicts, which may not exceed 10% of our meeting times (4 classes).

**Studying:** There are many potentially effective strategies for success. Read the text to be covered in class before coming to class. Read it again after class. Utilize the Math and Science Skills Center (<https://cip.kenyon.edu/content/mssc>). Work through the exercises and end-of-chapter problems, not just the assigned ones. Work through them three or four times. Pour libations to the chemical gods. Recopy your notes after each lecture. Make a slide-show of reactions you are trying to learn and play it as your screen-saver. Most importantly, ask question in class and during office hours. Your model kits are also essential. Familiarity with three-dimensional structure is a crucial skill for organic chemistry and one often neglected by students.

**Quizzes:** Quizzes are an important learning tool. A low-stakes quiz or activity will be given during the first 5 minutes and/or last 2 minutes of class on Mondays, Fridays, and occasional Wednesdays. Most of these quizzes and activities will contribute to your engagement grade for the semester (80 pts/semester). All you need to do to earn credit is complete the task to the best of your ability. Quizzes that take place at the beginning of class on Friday will be graded out of 10 pts (100 pts/semester). There will be no make-up quizzes but quizzes missed during excused absences will not impact your final grade (total points possible will be reduced). Because organic chemistry builds upon itself quiz content will be cumulative.

**Class participation:** I will call on you to answer relevant questions. Asking a question relevant to the intellectual content of the course counts towards your participation grade as does attending Department sponsored seminars.

**Exams:** The first three exams will be 50 minutes long. While the focus of each exam will be the material covered since the last exam, you must be familiar with basic concepts (stoichiometry, conformational analysis, etc) from earlier in the semester and prior courses. Blank copies of the exam you took will be available after you take the exam, but the key will only be available in my office. The final exam will be cumulative, 3 hours long, and at the date assigned by the registrar. Approximately one third of the material will come *directly* from exams administered during the semester. You may bring a cyclohexane model to each exam, but may not use a calculator or your own scratch paper.

**email Contact:** I will answer questions *via* email, often quickly. Messages sent after 9 pm, will not be read before morning. When class is in session, I will respond to student email within 24 hours >99% of the time.

**Electronic devices:** Do not use them in class. This policy is not just because I am a grumpy old man who just doesn't understand your generation and your music and, also, get off my lawn. Please see the American Psychological Association site for supporting evidence: [www.apa.org/research/action/multitask.aspx](http://www.apa.org/research/action/multitask.aspx).

**Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990:** If you have a disability requiring accommodation to fully participate in class, identify yourself to Erin Salva, Coordinator of Disability Services (PBX 5145, [salvae@kenyon.edu](mailto:salvae@kenyon.edu)). All information and documentation of disability is confidential. No accommodations will be given in this course without notification from Erin Salva.

**Title IX:** Kenyon College seeks to provide an environment that is free of gender bias, discrimination, and harassment. If you have been the victim of sexual harassment/misconduct/assault, interpersonal violence, or stalking I encourage you to report this. If you report this to me, I must notify Kenyon's Title IX coordinator of any information about the incident that you provide. Kenyon College's Title IX and VAWA Policy is available at: [www.kenyon.edu/directories/offices-services/title-ix/policy/](http://www.kenyon.edu/directories/offices-services/title-ix/policy/)

Date	Topic:	<i>Planned Schedule</i>	Book
<b>Structure &amp; Bonding</b>			
M 1/15	Octet Rule, Lewis Representation,		Ch 1, 11.11
W 1/17	Structures & Formulas, UN Number (11.11), Formal Charge,		
F 1/19	Quantum Description, Orbitals		
<b>Structure &amp; Reactivity</b>			
M 1/22	Arrows, Thermodynamics, Kinetics, Acids/Bases Chemistry,		Ch 2
W 1/24	Electrophiles & Nucleophiles, Functional Groups,		
F 1/26	Alkanes – Names, Structures, Properties, Conformation		
M 1/29			
<b>Spectroscopy</b>			
W 1/31	Magnetic Resonance and <sup>1</sup> H Chemical Shift,		Ch 10 11.8-9
F 2/2	Chemical Equivalence, Integration, Splitting,		
M 2/5	IR & Mass Spec		
W 2/7			
F 2/9			
M 2/12	<b>Exam I</b>		
<b>Reactions of Alkanes</b>			
W 2/14	Radicals – Structure, Uses, Radical Chain Mechanism,		Ch 3
F 2/16	Radical Halogenations – Reactivity and Selectivity,		
M 2/19	Synthetic Halogenation, CFCs, Alkane Stability		
<b>Cycloalkanes</b>			
W 2/21	Carbocycles – Nomenclature, Structure, Strain,		Ch 4
F 2/23	Cyclohexane, Larger Ring, Polycyclic Alkanes		
M 2/26			
<b>Stereochemistry</b>			
W 2/28	Isomerism, Chirality, Optical Rotation, Absolute Configuration,		Ch 5
F 3/2	Fischer Projections, Diastereomers, Meso Compounds, Reaction Stereochemistry		
	<i>Spring Break! 3/3 – 3/17 Spring Break!</i>		
M 3/19			
<b>Haloalkanes – Bimolecular Substitution</b>			
W 3/21	Haloalkane Properties, Nucleophilic Substitution, Arrow Pushing,		Ch 6
F 3/23	Kinetics and Stereochemistry of Nucleophilic Substitution,		
M 3/26	Influence of Leaving Group & Solvent,		
W 3/28	Influence of Sterics – Nucleophile & Substrate		
F 3/30	<b>Exam II</b>		
<b>Haloalkanes – Substitution &amp; Elimination</b>			
M 4/2	Solvolysis, Unimolecular Substitution & Stereochemical Consequences,		Ch 7
W 4/4	Effects of: Solvent, Nucleophile, Substrate & Leaving Group,		
F 4/6	Elimination Reactions,		
M 4/9	Substitution vs Elimination,		
W 4/11	E1CB, E1/E2 Data Analysis		
F 4/13			
<b>Alcohols – Synthesis</b>			
M 4/16	Alcohols – Nomenclature, Structure, Properties, & Industrial Preparation		Ch 8
W 4/18	Alcohol Synthesis – Nucleophilic, Redox, Organometallic		
F 4/20	Alcohol Synthesis – Organometallic Reagents & Synthetic Strategy		

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**Alcohols – Reactions**

M 4/23	Alcohol Reactions - Acid/Base & Carbocation	Ch 9
W 4/25	Esters from Alcohols, Ether Nomenclature, Properties, Williamson Synthesis	
F 4/27	<b>Exam III</b>	
M 4/30	Ethers – Synthesis and Reactions,	
W 5/2	Reactions of Epoxides, Sulfur Analogues, Physiological Relevance	
F 5/4		