

# CHEM F321

## Organic Chemistry I

### Fall 2018

**CRN(s):** 73258; 73259; 73260; 73261; 73262; 73263

**Credits:** 4 credits

**Lecture:** REIC 201, MWF 8:00 - 9:00 am

**Lab:** REIC 241, Various Times

**Prerequisite:** Chem F106X with grade of C or better.



**Lecture Instructor:** Jennifer Guerard, Ph.D.



Office: REIC 180

Office Hrs: Mon 1030 -1230 pm

Phone: (907) 474-5231

Email: [jguerard@alaska.edu](mailto:jguerard@alaska.edu)

**Lab Instructor:** Thomas Green, Ph.D.



Office: REIC 174

Office Hrs: Tues 1-3; Wed 1-2pm

Phone: (907) 474-1559

Email: [tkgreen@alaska.edu](mailto:tkgreen@alaska.edu)

Lab syllabus TBD

**Catalog Course Description:** A systematic study of the more important functional groups of carbon compounds, including their mechanisms of reaction, methods of synthesis, and physical and spectroscopic properties. Lab portion will include an introduction to synthetic techniques and spectroscopy.

**Course Goals:** The goals of this course are to understand the fundamental concepts of bonding of organic compounds, how conformations of hydrocarbons relate to stability, basic concepts of stereochemistry, reactions and associated mechanisms of hydrocarbons, and the use of spectroscopic techniques to determine structure of organic molecules

### Required Course Materials:

• **Textbook package sold via UAF Bookstore, includes:**

- Joel Karty *Organic Chemistry: Principles and Mechanisms* 2<sup>nd</sup> ed. Norton, 2018
- Print versions come with solutions manual study guide – and it's **super** helpful
- Online Homework: Subscription to Smartwork5 (FREE!!)

• **Laboratory textbook:**

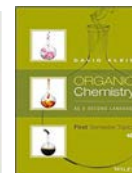
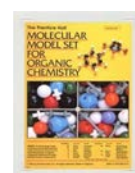
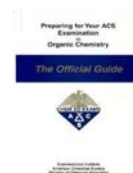
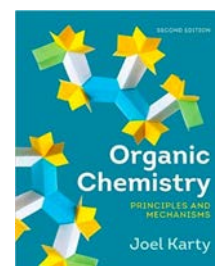
- Anne Padias, *Making the Connections: A How-to Guide for Organic Chemistry Lab Techniques*, 3<sup>rd</sup> ed.
- Lab book for recording observations (GIVEN TO YOU FOR FREE!!)

• **NON-programmable, NON-graphing scientific calculator**

• **Turning Technologies license AND clicker or Responseware on mobile device**

### HIGHLY Recommended Course Materials:

- **Workbook:** Klein, D. *Organic Chemistry as a Second Language: First Semester Topics*, 4<sup>th</sup> ed. Wiley, 2016
- Eubanks, I. Dwaine. *Preparing for Your ACS Examination in Organic Chemistry: The Official Guide*
- Molecular model kit – my favorite is in the UAF bookstore



### Important Dates:

Aug. 27<sup>th</sup>: First day of class

Sept. 7<sup>th</sup>: Deadline for adding classes, late registration, drops with no appearance on academic record

**Sept 19<sup>th</sup>: EXAM I (Ch 1-4, IC A, B)**

**Oct. 12<sup>th</sup>: EXAM II (Ch 5-7, IC E)**

**Nov. 7<sup>th</sup>: EXAM III (Ch 8-10, IR)**

Nov. 2<sup>nd</sup>: Last day for withdrawal with W

**Nov 30<sup>th</sup>: EXAM IV (Ch 11-13, NMR)**

Dec. 9<sup>th</sup>: Last day of instruction

**Dec. 12<sup>th</sup>: FINAL 8-10 am**

Dec. 19<sup>th</sup>: Grades Posted

**Student Learning Outcomes:** At the end of this course, students should be to

1. Identify and draw common organic functional groups.
2. Name hydrocarbons, including alkanes, alkenes, alkynes, dienes and alcohols.
3. Apply conformational analysis of cyclohexane and associated derivatives.
4. Predict the reactivity of alkanes, alkenes, alkynes, dienes, and alcohols.
5. Know common reagents used for hydrocarbon transformation into other functional groups.
6. Interpret IR, NMR spectra of simple organic compounds to arrive at a structure.
7. Draw and interpret 3D structures of stereoisomers.
8. Predict and write mechanisms of reactions of hydrocarbons based on fundamental concepts of acid/base chemistry (nucleophiles and electrophiles).

**Course Structure:** The coursework will follow topics in the order described on the Tentative Schedule. The instructor will lecture using a combination of slides, whiteboard, clickers, groupwork, and worksheets, providing copies of slides to the students via Blackboard. Clickers, quizzes, homework, in-class activities, and exams will assess student understanding of concepts. Lab schedule/syllabus will be handed out during lab.

### Evaluation and Grade Assignment:

Smartwork5 HW:	120 points
In class quizzes	80 points
In class activities/clickers	50 points
EXAM 1 (Sept 19, 2018):	100 points
EXAM II (Oct 12, 2018):	100 points
EXAM III (Nov 7, 2018):	100 points
EXAM IV (Nov 30, 2018):	100 points
Comprehensive Final:	100 points
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Total Lecture Points:	750 points
Total Lab Points	250 points
<i>(scaled from lab total)</i>	
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<b>Total Course Points:</b>	<b>1000 points</b>

### Grading:

<b>A =</b>	<b>900 – 1000 points</b>
<b>B =</b>	<b>800 – 899 points</b>
<b>C =</b>	<b>700 – 799 points</b>
<b>D =</b>	<b>600 – 699 points</b>
<b>F =</b>	<b>0 – 599 points</b>

**Final Grade Rounding Policy:** If cumulative final grade is within 5 points of a grade point cutoff **AND** final exam percentage falls into a letter grade above that from the cumulative letter grade, then final grade will be rounded up to next letter grade. Example: if total course points = 795 and final exam score is  $\geq 80\%$ , final grade would be rounded to B. I will not be using +/- grading.

### Notes and Policies:

**Smartwork5 homework (FREE!).** Instructions are on Blackboard under Course Materials for Smartwork5 registration. **The first assignment is due on WEDNESDAY, Sept 5<sup>th</sup> at 8:00 AM.** Expect homework assignments to take *at least* a few hours each week. **Late assignments are not accepted.** It is important to plan accordingly in order to finish the homework by the due date. Due dates are listed in the syllabus and are due at 8:00 AM on dates shown. Homework scores will be summed from 34 required assignments, and 3 extra credit assignments (XC1 worth  $\frac{1}{2}$  of a homework assignment, XC2 & XC3 each worth one homework assignment). This sum out of 340 will then be scaled to out of 120 points.

**Class Participation.** Several in-class activities require individual responses using **Turning Technologies Clickers**. **It is thus important to attend and bring your clicker to class every day**, and *in the case of absence, inform the instructor as soon as it is known, or if unexpected, within one business day*. Total points earned from clickers will be normalized to 60 points, out of which only 50 will be counted, to provide a cushion in case of illness or other reasons for missed class. A maximum of 50 points will be applied to a student's grade (see point breakdown). Point opportunities may vary from day to day. It is the student's responsibility to bring the clicker/responseware-installed-device to each class, replace if lost, verify it is registered correctly on the instructor's database, and keep it supplied with fresh batteries. **It is ultimately the student's responsibility** to address problems with their clicker and/or check with the instructor concerning their clicks. **Clicker IDs must be registered through Blackboard (<http://classes.uaf.edu>) by SUNDAY, Sept 9<sup>th</sup>, 11:59 PM.** Directions for registering clickers are posted to Blackboard. **Note: A purchased license with Turning is REQUIRED** in order to be able to see your responses and properly attribute points, *even if you using an older clicker*.

**Exams.** No electronic devices are allowed during exams other than a non-programmable scientific calculator. Note - you must know how to use your own calculator, I cannot help you with your calculator during exams. You must turn in your exam before leaving the room. Molecular model kits are allowed during all exams. ***Use of cell phones or electronic devices other than a non-programmable scientific calculator during exams constitutes cheating and will result in an F in the course.***

**Quizzes.** 12 quizzes (lowest 2 scores dropped) will be administered by paper or clicker, each worth 10 points (see syllabus schedule; 5 questions each, open notes, ~15 min). Quiz percentage will be scaled to 80 points.

**Honor Code.** **Chemistry Department policy states that any student caught cheating on graded work will be assigned a course grade of F.** Course drop forms will not be signed in these cases. **Allowing your exam to be visible to others is considered to be cheating.**

**Absences.** Make-up exams are *only* allowed in the event of a legitimate cause **and** proper notification to the instructor. Known absences (e.g., intercollegiate sports, travel for military or university purposes) are required to provide notification by email **before** the exam date; unexpected/emergency absences (e.g., illness, family, or personal emergency) need to provide notification at the earliest possible opportunity. You may be asked to provide documentation for the absence. Make-ups should be scheduled as soon as possible from the originally scheduled date. *Summary: If you have **any** absences (scheduled or unscheduled), or questions about absences/make-ups, email your instructors: Dr. Guerard ([iguerard@alaska.edu](mailto:iguerard@alaska.edu)) for lecture, and Dr. Green ([tkgreen@alaska.edu](mailto:tkgreen@alaska.edu)) for lab.*

**Mobile Devices and Laptops.** Mobile devices must be turned to silent or “vibrate” mode during class. Use of electronic devices that facilitate learning (e.g., as clickers) are permitted. *Any other use is prohibited.*

**Instructor-Initiated Withdrawals.** Until **Friday, November 2<sup>nd</sup>**, the instructor has the right to withdraw a student who has not participated substantially in the course. Any of (or combination of) the following constitute non-participation: 1) Missed exam or 2 quizzes without an excused absence, 2) At least 2 incomplete homework assignments, or 3) Less than 50% of participation points without excused absence(s).

## Support & Accommodations:

**Student protections and services statement:** Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans’ services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: [www.uaf.edu/handbook/](http://www.uaf.edu/handbook/).

**Chemistry Learning Center (CLC):** TAs keep regular office hours, which can be found on the CLC calendar: <https://www.uaf.edu/chem/clc/>. Chemistry computer lab (REIC 172) is available for **course related activities**. See <http://www.uaf.edu/chem/instrumentation/policies>. Organic TAs can help out with lecture concepts too!

**Disabilities Services.** The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities. If you have specific physical, psychiatric or learning disabilities and require reasonable accommodations, please let me know early in the semester (within first two weeks of class) so that your learning needs may be appropriately met. Disability Services is located in room 208 of the Whitaker Building. For more information please contact Disability Services by email at [uaf-disabilityservices@alaska.edu](mailto:uaf-disabilityservices@alaska.edu), by phone at 474-5655, or by TTY at 474-1827.

**Veteran Support Services.** Walter Crary ([weccary@alaska.edu](mailto:weccary@alaska.edu)) is the Veterans Service Officer at the Veterans Resource Center, 111 Eielson Building, 474-2475. Fairbanks Vet Center: 456-4238. VA Community Based Outpatient Clinic at Ft. Wainwright: 361-6370.

**Student Support Services.** The Student Support Services (SSS) program located in 512 Greuning (474-6844), provides opportunities for academic development, assists students with college requirements, and serves to motivate students toward successful completion of their degree program.

**Diversity, Equal Opportunity, and Affirmative Action:** The University of Alaska Fairbanks is accredited by the Northwest Commission on Colleges and Universities. UAF is an affirmative action/equal opportunity employer and educational institution. University of Alaska Board of Regents have clearly stated in BOR Policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska.



## CHEM F321 Fall 2018 Tentative Schedule

	Date	Assigned Readings	Klein	Assignments
<b>Week 1</b>	M 8/27	Ch 1: Lewis structures, Resonance	Ch 1-2	
	W 8/29	Ch 1: Functional Groups		
	F 8/31	Ch 2: Intermolecular Interactions		<b>Quiz 1</b>
<b>Week 2</b>	W 9/5	Ch 3: Orbital Hybridization	Ch 4	<b>HW1a due, HW xc1 due,</b>
	F 9/7	Ch IC A, B: Nomenclature	Ch 5	<b>HW 1b due, HW 2 due</b>
<b>Week 3</b>	M 9/10	Ch IC E: Nomenclature		<b>Quiz 2, HW 3 due</b>
	W 9/12	Ch 4.1-4.5: Conformations	Ch 6	<b>HW IC AB due</b>
	F 9/14	Ch 4.6-4.10: Conformations		<b>HW IC E due</b>
<b>Week 4</b>	M 9/17	Practice Problems		<b>Quiz 3, HW 4a due</b>
	<b>W 9/19</b>	<b>EXAM 1 (Ch 1-4, IC AB, E)</b>		<b>HW 4b due</b>
	F 9/21	Ch 5.1-5.4, IC C: Chirality		
<b>Week 5</b>	M 9/24	Ch 5.5-5.7, 5.13-5.15: Chirality	Ch 7	
	W 9/26	Ch 5.8-5.12: Chirality		<b>HW 5a due</b>
	F 9/28	Ch 6.1-6.3, 6.10-6.11: Acidity	Ch 3	<b>Quiz 4, HW 5b due</b>
<b>Week 6</b>	M 10/1	Ch 6.4-6.9: Acidity		<b>HW 5c due</b>
	W 10/3	Ch 7, IC D: Elementary Steps, SN2	Ch 8	<b>Quiz 5, HW 6a due</b>
	F 10/5	Ch7, IC D: Elementary Steps, E2		<b>HW 6b due</b>
<b>Week 7</b>	M 10/8	Ch 15.4-15.6 – IR Spectroscopy		<b>HW 7a due</b>
	W 10/10	Practice problems		<b>Quiz 6, HW 7b due</b>
	<b>F 10/12</b>	<b>EXAM 2 (Ch 5-7, IC C, D)</b>		
<b>Week 8</b>	M 10/15	Ch IC1, Ch 8.1-8.4: SN1	Ch 9,10	<b>HW 15 due</b>
	W 10/17	Ch 8.5-8.7: SN1, E1		<b>HW 8a due</b>
	F 10/19	Ch 9.1-9.9: SN1, SN2, E1, E2		<b>Quiz 7, HW 8b due</b>
<b>Week 9</b>	M 10/22	Ch 9.10-9.14: SN1, SN2, E1, E2		<b>HW 8c due</b>
	W 10/24	Practice Problems		<b>Quiz 8, HW 9a due</b>
	F 10/26	Ch 10.1-10.4: SN1, SN2, E1, E2	Ch 12	<b>HW 9b due</b>
<b>Week 10</b>	M 10/29	Ch 10.5-10.7: SN1, SN2, E1, E2		<b>HW 9c due</b>
	W 10/31	Ch 10.8-10.10: SN1, SN2, E1, E2		<b>HW 10a due</b>
	F 11/2	Ch 16.1-16.15 – NMR		<b>Quiz 9, HW 10b due</b>
<b>Week 11</b>	M 11/5	Practice Problems		<b>HW 10c due</b>
	<b>W 11/7</b>	<b>EXAM 3 (Ch 8-10, IR)</b>		<b>HW xc2 due</b>
	F 11/9	Ch 11.1-11.5: Electrophilic Add.	Ch 11	<b>HW 16 due</b>
<b>Week 12</b>	M 11/12	Ch 11.6-11.8: Electrophilic Add.		<b>HW 11a due</b>
	W 11/14	Ch 11.9-11.12: Electrophilic Add.		<b>HW 11b due</b>
	F 11/16	Ch 12.1 – 12.3: Electrophilic Add.		<b>Quiz 10, HW 11c due</b>
<b>Wk 13</b>	M 11/19	Ch 12.4-12.5: Electrophilic Add.		<b>HW 12a due</b>
<b>Week 14</b>	M 11/26	Ch 12.6-12.8: Electrophilic Add.		<b>HW 12b due</b>
	W 11/28	Practice Problems		<b>Quiz 11, HW 12c due</b>
	<b>F 11/30</b>	<b>EXAM 4 (Ch 11-12, NMR)</b>		
<b>Week 15</b>	M 12/3	Ch 13.1-13.3: Organic Synthesis	Ch 13	
	W 12/5	Ch 13.4-13.8: Organic Synthesis		<b>HW 13a due</b>
	F 12/7	Practice Problems		<b>Quiz 12, HW 13b due</b>
<b>FINAL</b>	<b>W 12/12</b>	<b>COMPREHENSIVE FINAL 8-10 AM</b>		<b>HW xc3 due</b>

**Amending this Syllabus:** Before the last drop date, I may revise the syllabus to correct for any errors. Revision at a later time would require majority vote by students present in class on day issue is decided. Adjustments to the lecture schedule and homework due dates may be made at the instructor's discretion anytime during the semester. Any revisions will be distributed via Blackboard and announced in class.