

**CRN(s):** 33255; 33256; 33257; 4 credits

**Lecture:** REIC 202, MWF 1-2 pm

**Prerequisite:** Chem 321 with grade of C or better.

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

Office: REIC 180

Phone: (907) 474-5231

**Lab:** REIC 241, Various Times

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

Office Hours: Wed 3:30-5:00

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

**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 Materials

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

- Joel Karty *Organic Chemistry: Principles and Mechanisms*. Norton, 2014
  - Hardcover + solutions manual + ebook option
  - Looseleaf + solutions manual + ebook option
  - Ebook only option
- Online Homework: Subscription to Smartwork (included with all textbook pkgs). To purchase Smartwork separately, go to <http://books.wwnorton.com/books/smartworkcontent.aspx?tid=4643> and select the name of the textbook. An option for Smartwork only will be available or Smartwork with the Ebook.
- **Equipment: NON-programmable, NON-graphing scientific calculator**
- **Turning Technologies license AND device** (either hand-held clicker or mobile device with Responseware)

**Recommended:** • **Workbook:** Klein, D. *Organic Chemistry as a Second Language: Second Semester Topics*, 3<sup>rd</sup> ed. Wiley, 2012

- Eubanks, I. Dwaine. *Preparing for Your ACS Examination in Organic Chemistry: The Official Guide*
- Molecular model kit

### Important Dates

Jan. 18<sup>th</sup>: First day of class  
 Jan. 27<sup>th</sup>: Deadline for adding classes, late registration, fee payment.  
 Last day to drop with no appearance on academic record

**Feb 15<sup>th</sup>: EXAM I (Ch 17-19)**

**Mar 10<sup>th</sup>: EXAM II (Ch 20-21)**

Mar. 31<sup>st</sup>: Last day to drop with a W or Faculty initiated withdrawals.

**Apr 7<sup>th</sup>: EXAM III (Ch 22-24)**

**Apr 26<sup>th</sup>: EXAM IV (Ch 25-26)**

May 1<sup>st</sup>: Last day of instruction

**May 3<sup>rd</sup>: FINAL 1:00-3:00pm (ACS Final)**

May 10<sup>th</sup>: Grades Posted

**Note, Blackboard address is now <http://classes.alaska.edu> !!**

## Course Goals

**Course Goals:** The goals of this course to know reaction chemistry of major functional groups of organic molecules (molecules with carbon), including knowing how to write mechanisms for organic reactions, how to write organic reactions in a logical sequence to demonstrate how a molecule might be synthesized in the laboratory, and the use of spectroscopic techniques to determine structure of organic molecules

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

## Student Learning Outcomes

At the end of this course, students should be to:

1. Understand fundamental concepts of bonding and acidity of organic functional groups.
2. Name a variety of organic compounds.
3. Predict the reactivity of organic compounds involving nucleophilic and electrophilic substitution, elimination, and addition mechanisms and combinations thereof.
4. Know common reagents used for hydrocarbon transformation into other functional groups.
5. Interpret IR, NMR, and mass spectra of organic compounds to arrive at a structure.
6. Draw and interpret 3D structures of stereoisomers.
7. Write out synthetic pathways using the correct order of reactants and reagents in order to arrive at a target molecule.

## Evaluation and Grade Assignment

### Point Breakdown:

|                         |            |
|-------------------------|------------|
| Smartwork HW (12):      | 120 points |
| In class quizzes (10):  | 100 points |
| EXAM I (Feb 15, 2017):  | 100 points |
| EXAM II (Mar 10, 2017): | 100 points |
| EXAM III (Apr 7, 2017): | 100 points |
| EXAM IV (Apr 26, 2017): | 80 points  |
| Comprehensive Final:    | 150 points |
| <hr/>                   |            |
| Total Lecture Points:   | 750 points |
| Total Lab Points:       | 250 points |

**Total Course Points: 1000 points**

### Grading:

|     |          |                    |
|-----|----------|--------------------|
| A = | ≥ 90%    | (≥ 900 points)     |
| B = | 80 – 89% | (800 – 899 points) |
| C = | 70 – 79% | (700 – 799 points) |
| D = | 60 – 69% | (600 – 699 points) |
| F = | < 60%    | (< 600 points)     |

*I may elect to lower the grade point cutoffs, but will not raise them. I will not be using +/- grading.*

## Notes and Policies

**Homework - Smartwork.** Follow the instructions on Blackboard under Course Materials for registration with Smartwork. You will need: 1) Your uaf email address. 2) The enrollment key for the course **ORGCHEM11214** (case-sensitive) and 3) A registration code from W. W. Norton (comes with textbook packages purchased at the bookstore). **The first assignment is due by the start of class on Wednesday, Jan 25<sup>th</sup> (1:00 PM).** It is advised to register *before* then in order to allow sufficient time to complete the first assignment. Expect homework assignments to take *at least* a few hours each week. **Late assignments are not accepted.** Homework assignments are open for several days and thus 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 1:00 PM (the start of class) on dates shown.

**Class Participation/Turning Technologies Clickers:** Most class periods will contain individual or group problem activities to facilitate learning, which may occur on paper or by clickers. Several in-class activities will require individual responses using **Turning Technologies Clickers**. **It is thus important to attend and bring your clicker to class every day. Many quizzes may be administered by clicker!!!**

It is the student's responsibility to bring the clicker/Response ware-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.alaska.edu>) by SUNDAY, Jan 22<sup>nd</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*.

**Quizzes.** Quiz dates are listed on the syllabus schedule, covering review of material from recent lectures. They may be administered via clickers (see above) or via paper/pencil, and students will be notified ahead of time of the format for upcoming quizzes. **12 quizzes will be administered throughout the term. The lowest 2 scores will be dropped.**

**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 as per the policy of the Chemistry Department.*

**\*\*ACS Final Exam.** The final exam will be the American Chemical Society Organic Chemistry exam, covering the entire 2-semester course sequence of organic chemistry (CHEMF321 & CHEMF325).

**Make-up exams and quizzes** are only allowed in the event of a legitimate excuse as determined by the instructor. If you anticipate an absence from an exam, you need to bring it to my attention *before* the exam date, or in the case of unexpected absences, within one business day.

**Mobile Devices and Laptops.** Mobile devices must be turned to silent or "vibrate" mode during class. Use of electronic devices that facilitate learning are permitted. Any other use is prohibited. **Mobile devices and laptops are not allowed during exams.**

**Instructor-Initiated Withdrawals.** Until **Mar. 31<sup>st</sup>** the instructor has the right to withdraw a student who has not participated substantially in the course. Any (or a combination) of the following constitute non-participation: 1) Missed exam without excused absence, 2) At least 2 incomplete homework or quizzes, or 3) Less than 50% attendance registered by clickers without excused absence(s).

### Ethical Considerations

Chemistry Department policy states 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. **Examples of cheating include, but are not limited to:**

- Copying another student's answer or allowing your answers to be copied during a quiz or exam
- Using unauthorized resources during a quiz or exam
- Using another student's clicker for any reason

Students must also adhere to UAF policies, the student code of conduct as well as the University of Alaska *Honor Code*, which states:

*“Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors. Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion.”*

### Support & Accommodations

**Chemistry Learning Center (CLC)** – CHEM 325 TAs keep regular office hours, which can be found on the CLC calendar: <https://www.uaf.edu/chem/clc/>. Chemistry computer lab (REIC 170, 172) is available for **course related activities** - See <http://www.uaf.edu/chem/instrumentation/policies>.

**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. Students with documented disabilities who may need reasonable academic accommodations should discuss these with me during the first two weeks of class. I will work with the Office of Disabilities Services (\*208 Whitaker, 474-5655) to provide reasonable accommodation to students with disabilities. You will need to provide documentation of your disability to Disability Services.

**Veteran Support Services.** Walter Crary ([wecrary@alaska.edu](mailto:wecrary@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.

**Amending this Syllabus:** Before the 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.



## Tentative Schedule

| Week/Date |          |             | Lecture Topic/Readings                                | Klein   | HW and Quizzes                            |
|-----------|----------|-------------|---|---------|---|
| WEEK 1    | W        | 1/18        | OCHEM 1 Review/Intro                                  |         | HW xc 1 open (CHEM 321 rev)               |
|           | F        | 1/20        | Ch 17.1-17.4: Nuc Add 1                               | Ch 6    | HW 1 open (Ch 17)                         |
| WEEK 2    | M        | 1/23        | Ch 17.5-17.9: Nuc Add 1                               |         | <b>Quiz 1</b>                             |
|           | W        | 1/25        | Ch 17.10-17.13: Nuc Add 1                             |         | <b>HWxc1 due</b>                          |
|           | F        | 1/27        | Ch 18.1-18.3: Nuc Add 2                               | Ch 6, 8 | <b>HW1 due, HW2 open (Ch 18a)</b>         |
| WEEK 3    | M        | 1/30        | Ch 18.4-18.9: Nuc Add 2                               |         | <b>Quiz 2</b>                             |
|           | W        | 2/1         | Ch 16, IC2 Mass Spectrometry, Dr. GREEN               |         | HWxc2 open (Mass Spec)                    |
|           | F        | 2/3         | Ch 18.10-18.11: Nuc Add 2                             |         | <b>HW2 due, HW3 open (Ch 18b)</b>         |
| WEEK 4    | M        | 2/6         | Ch 18.10-18.11: Nuc Add 2                             |         | <b>Quiz 3</b>                             |
|           | W        | 2/8         | Ch 19: Org. Synthesis 2                               |         | <b>HWxc2 due, HW4 open (Ch 19)</b>        |
|           | F        | 2/10        | Ch 19: Org. Synthesis 2                               |         | <b>HW3 due</b>                            |
| WEEK 5    | M        | 2/13        | Exam I Review   |         | <b>Quiz 4</b>                             |
|           | <b>W</b> | <b>2/15</b> | <b>EXAM I: Ch 17-19</b>                               |         | <b>HW4 due</b>                            |
|           | F        | 2/17        | Ch 20.1-20.3: Nuc Add Elim 1                          | Ch 7    | HW5 open (Ch 20)                          |
| WEEK 6    | M        | 2/20        | Ch 20.4-20.5: Nuc Add Elim 1                          |         |   |
|           | W        | 2/22        | Ch 20.6-20.8: Nuc Add Elim 1                          |         | <b>Quiz 5</b>                             |
|           | F        | 2/24        | Ch 21.1-21.3: Nuc Add Elim 1                          |         | <b>HW5 due, HW6 open (Ch 21a)</b>         |
| WEEK 7    | M        | 2/27        | Ch 21.1-21.3: Nuc Add Elim 2                          |         |   |
|           | W        | 3/1         | Ch 21.4-21.8: Nuc Add Elim 2                          |         | <b>Quiz 6, HW7 open (Ch 21b)</b>          |
|           | F        | 3/3         | Ch 21.9-10: Nuc Add Elim 2                            |         | <b>HW6 due</b>                            |
| WEEK 8    | M        | 3/6         | Ch 21.11-14: Nuc Add Elim 2                           |         |   |
|           | W        | 3/8         | Review  |         | <b>Quiz 7, HW7 due</b>                    |
|           | <b>F</b> | <b>3/10</b> | <b>EXAM II: Ch 20-21</b>                              |         |   |
| WEEK 9    | M        | 3/20        | Ch 22.1-22.7: EAS 1                                   | Ch 4    | HW8 open (Ch 22)                          |
|           | W        | 3/22        | Ch 22.8-22.10: EAS 1                                  |         |   |
|           | F        | 3/24        | Ch 23.1-23.6: EAS. 2                                  |         | <b>Quiz 8, HW9 open (Ch 23)</b>           |
| WEEK 10   | M        | 3/27        | Ch 23.7-23.9: EAS 2                                   |         | <b>HW8 due</b>                            |
|           | W        | 3/29        | Ch 23.10-23.14: EAS. 2                                | Ch 5    |   |
|           | F        | 3/31        | Ch 24: Diels Alder                                    | Ch 10   | <b>Quiz 9, HW9 due, HW10 open (Ch 24)</b> |
| WEEK 11   | M        | 4/3         | Ch 24: Pericyclic Reactions                           |         |   |
|           | W        | 4/5         | Review  |         | <b>Quiz 10</b>                            |
|           | <b>F</b> | <b>4/7</b>  | <b>EXAM III: Ch 22-24</b>                             |         | <b>HW10 due</b>                           |
| WEEK 12   | M        | 4/10        | Ch 25.1-25.4: Free Radicals                           |         | HW 11 open (Ch 25)                        |
|           | W        | 4/12        | Ch 25.4-25.6: Free Radicals                           |         |   |
|           | F        | 4/14        | Ch 25.7-25.9: Free Radicals                           |         | <b>Quiz 11</b>                            |
| WEEK 13   | M        | 4/17        | Ch 26.1-26.4: Polymers                                |         | <b>HW11 due, HW 12 open (Ch 26)</b>       |
|           | W        | 4/19        | Ch 26.5-26.9: Polymers                                |         |   |
|           | M        | 4/24        | Review  |         | <b>Quiz 12</b>                            |
| WEEK 14   | <b>W</b> | <b>4/26</b> | <b>EXAM IV: CH 25-26</b>                              |         | <b>HW 12 due</b>                          |
|           | F        | 4/28        | REVIEW  |         |   |
|           | M        | 5/1         | REVIEW  |         |   |
| WEEK 15   | <b>W</b> | <b>5/3</b>  | <b>COMPREHENSIVE FINAL EXAM 2 HOURS, 1:00-3:00 PM</b> |         |   |