



# CHEM F325

## Organic Chemistry II

### Spring 2016

**CRN(s):** 37492, 37494, 37496; 4 credits

**Prerequisite:** Chem F321 with grade of C or better.

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

Office: REIC 180

Phone: (907)474-5231

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

**Lab:** REIC 241, Various Times

**Office Hours:** M 1030-1200 and F 200-330

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**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.*

#### Required Course Materials:

- Wade Jr., L.G. *Organic Chemistry*. 8th ed., Pearson, 2013
- Klein, D. *Organic Chemistry as a Second Language: Second Semester Topics*, 3<sup>rd</sup> ed. Wiley, 2012
- Online Homework: Subscription to Sapling Learning: [www.saplinglearning.com](http://www.saplinglearning.com)
- **NON-programmable, NON-graphing** scientific calculator
- Turning Technologies clicker or ResponseWare mobile app

#### Recommended Materials:

- Wade Jr., L.G. and Simek, Jan William. *Solutions Manual for Organic Chemistry*. Pearson, 2013
- Eubanks, I. Dwaine. *Preparing for Your ACS Examination in Organic Chemistry: Official Guide*
- Prentice Hall Molecular Model Set for Organic Chemistry (or other molecular modeling kit)
- Multicolored pen or pens for detailed notetaking

#### Important Dates

Jan. 15 <sup>th</sup>	First day of class	Mar. 25 <sup>th</sup> :	Last day to drop with W or Faculty initiated withdrawals.
Jan. 22 <sup>nd</sup> :	Deadline for adding classes, late registration, fee payment	Mar. 30 <sup>th</sup> :	EXAM III (Ch 21, 22, 25)
Jan. 29 <sup>th</sup> :	Last day for 100% refund, last day to drop with no academic record	Apr. 25 <sup>th</sup> :	EXAM IV (Ch 23, 24, 26)
Feb. 1 <sup>st</sup> :	EXAM I (Ch 16-17)	May 2 <sup>nd</sup> :	Last day of instruction
Mar. 2 <sup>nd</sup> :	EXAM II (Ch 18-20)	May 3 <sup>rd</sup> :	ACS FINAL EXAM, 1-3pm
		May 11 <sup>th</sup> :	Grades Posted

**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 and how to write organic reactions in a logical sequence to demonstrate how a molecule might be synthesized in the laboratory.

#### Student Learning Outcomes

At the end of this course, students should be proficient in their ability to:

1. Understand fundamental concepts of bonding in organic functional groups.
2. Name organic compounds.
3. Predict the reactivity and write mechanisms of reactions of aromatic compounds, phenols, aldehydes, ketones, carboxylic acids and their derivatives, and amines.
4. Know the fundamental structures of biological molecules such as carbohydrates, amino acids, proteins, and lipids.

5. Understand basic concepts of stereochemistry and apply it to reaction chemistry.
6. Interpret IR, mass, and NMR spectra of simple organic molecules in order to arrive at a structure.
7. Write out synthetic pathways using the correct order of reactants and reagents in order to arrive at a target molecule.

**Course Structure:** The coursework will follow the textbook in the order described on the Tentative Lecture Schedule. The instructor will lecture on the theoretical aspects of organic chemistry, using a combination of slides and whiteboard, providing copies of notes to the students via Blackboard. Clickers will be used in class to assess student understanding of concepts.

### Evaluation and Grade Assignment

#### Point Breakdown:

Sapling Learning HW:	100 points
(10 assignments @ 10 points each)	
In class quizzes	100 points
(10 quizzes @ 10 points each)	
EXAM I (Feb 1, 2016):	100 points
EXAM II (Mar 2, 2016):	100 points
EXAM III (Mar 30, 2016):	100 points
EXAM IV (Apr 25, 2016):	100 points
Comprehensive Final**:	150 points
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Total Lecture Points:	750 points
Total Lab Points:	250 points
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<b>Total Course Points:</b>	<b>1000 points</b>

#### Grading:

<b>A =</b>	<b>≥ 90%</b>	<b>(≥ 900 points)</b>
<b>B =</b>	<b>80 – 89%</b>	<b>(800 – 899 points)</b>
<b>C =</b>	<b>70 – 79%</b>	<b>(700 – 799 points)</b>
<b>D =</b>	<b>60 – 69%</b>	<b>(600 – 699 points)</b>
<b>F =</b>	<b>&lt; 60%</b>	<b>(&lt; 600 points)</b>

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

### Notes and Policies

**Homework - Sapling Learning.** To create an account, go to <http://saplinglearning.com> and click on your country at the top right, and create an account. Once logged in, find this course in the list (you may need to expand the subject and term categories) and click the link, following instructions for payment and access. **The first assignment is due MONDAY, Jan 25<sup>th</sup>, 11:55 PM.** It is advised to register *before* then to allow sufficient time to complete the first assignment. Expect assignments to take *at least* a few hours each week. **Late assignments are not accepted.** Homework assignments are listed in the syllabus and are due at 11:55 pm on dates shown.

**Turning Technologies Clickers.** Clickers will be used in class to gauge student understanding of concepts and practice working through problems, and may be used as devices for administering quizzes during the course. Only clicker questions administered as quizzes will count toward a student's grade. **Clicker IDs must be registered through Blackboard (<http://classes.uaf.edu>) by THURSDAY, Jan 21<sup>st</sup>, 11:59 PM.** To register your clicker on Blackboard, click Tools on the left panel of the course site, then Turning Technologies.

**Absences. Make-up quizzes or exams** are only allowed in the event of a legitimate excuse as determined by the instructor. If you anticipate an absence from an exam, bring it to my attention *before* the exam date, or in the case of unexpected absences, within one business day. I will attempt to record lectures and coordinate with OIT to make them accessible on Blackboard for students to view.

**Quizzes.** Quiz dates are listed on the syllabus schedule. They may be administered via clickers (see above) or via paper/pencil. Topics covered will be disclosed throughout the term.

**Exams.** No electronic devices are allowed during exams other than a non-programmable scientific calculator. You must turn in your exam before leaving the room. Molecular models are allowed and encouraged 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 (see Honor code).* **Mobile devices** are not allowed during exams.

**\*\*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).

**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.

**Instructor-Initiated Withdrawals.** Until **Friday, March 25<sup>th</sup>**, the instructor has the right to withdraw a student who has not participated substantially in the course. Any of the following constitute non-participation:

- 1) Exam I or II missed without an excused absence, or
- 2) At least 2 incomplete homework assignments, or
- 3) At least 2 missed quizzes without an excused absence.

### **Support & Accommodations**

**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 slightly 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. Any revisions will be distributed to all students via Blackboard and announced in class. Adjustments to the tentative lecture schedule, homework due dates and readings will be made throughout the course at the instructor's discretion and if so, communicated to students via Blackboard.*

Tentative Lecture Schedule

	Date	Lecture Topic	Wade Reading	Klein Wkbk	Assignments
WEEK 1	F 1/15	OCHEM 1 Review	Ch 1 - 15	Ch 1-2	HW1 open
	M 1/18	<i>Alaska Civil Rights Day – No Class</i>			
	W 1/20	Ch 16: Aromatics	Ch 16		
	F 1/22	Ch 17: Electro. arom. sub., <b>QUIZ 1</b>	17.1 - 17.8	Ch 3	HW2open
WEEK 2	M 1/25	Ch 17: Friedl-Crafts	17.9 - 17.11	Ch 3.3	<b>HW1 due</b>
	W 1/27	Ch 17: Nucleophilic aromatic sub.	17.12 - 17.16	Ch 4	
	F 1/29	Exam 1 Review, <b>QUIZ 2</b>			<b>HW2 due</b>
WEEK 3	<b>M 2/1</b>	<b>EXAM I (Ch 16-17)</b>			
	W 2/3	MASS SPEC – Dr. Green	12.13-12.15		
	F 2/5	Ch 18: Carbonyls and synthesis	18.1 - 18.10	Ch 5.1	HW3 open
WEEK 4	M 2/8	Ch 18: Nuc. addition to carbonyls	18.11 - 18.14	Ch 5.2 - 5.7	
	W 2/10	Ch 18: Condensations of carbonyls	18.15 – 18.18		
	F 2/12	Ch 18: Redox rxns, <b>QUIZ 3</b>	18.19 - 18.20	Ch 5.8 – 5.9	
WEEK 5	M 2/15	Ch 19: Reactions of amines	19.1 - 19.10	Ch 8.1, 8.4	HW4 open, <b>HW3 due</b>
	W 2/17	Ch 19: Reactions of amines	19.11 - 19.17	Ch 8.5 – 8.6	
	F 2/19	Ch 19: Amine synthesis, <b>QUIZ 4</b>	19.18 - 19.20	Ch 8.2 – 8.3	
WEEK 6	M 2/22	Ch 20: Intro carboxylic acids	20.1 - 20.8		<b>HW4 Due, HW5 open</b>
	W 2/24	Ch 20: COOH reactions	20.9 - 20.12		
	F 2/26	Ch 20: COOH reactions, <b>QUIZ 5</b>	20.13 - 20.15		
WEEK 7	M 2/29	Exam 2 review			<b>HW5 due</b>
	<b>W 3/2</b>	<b>EXAM II (Ch 18, 19, 20)</b>			
	F 3/4	Ch 21: COOH derivatives	21.1 - 21.5	Ch 6.1	HW6 open
WEEK 8	M 3/7	Ch 21: COOH derivative reactions	21.6 - 21.16	Ch 6.2 – 6.7	
	W 3/9	Ch 25: Lipids	Ch 25		
	F 3/11	Ch 22: $\alpha$ -sub. of carbonyls, <b>QUIZ 6</b>	22.1 - 22.6	Ch 7.1 – 7.6	<b>HW6 due, HW7 open</b>
WEEK 9	M 3/21	Ch 22: Aldol condensations	22.7 - 22.11	Ch 7.7	
	W 3/23	Ch 22: Condensations continued	22.12 - 22.9	Ch 7.8 – 7.10	
	F 3/25	Exam III review, <b>QUIZ 7</b>			
WEEK 10	M 3/28	Exam III review			<b>HW7 due</b>
	<b>W 3/30</b>	<b>EXAM III (Ch 21, 22, 25)</b>			
	F 4/1	Ch 23: Intro to carbohydrates	23.1 - 23.11		HW8 open
WEEK 11	M 4/4	Ch 23: Monosaccharide reactions	23.12 - 23.18		
	W 4/6	Ch 23: Nucleic acids	23.19 - 23.21		
	F 4/8	Ch 24: Amino acids, <b>QUIZ 8</b>	24.1 - 24.4		<b>HW8 due, HW9 open</b>
WEEK 12	M 4/11	Ch 24: Amino acid reactions	24.5 - 24.7		
	W 4/13	Ch 24: Peptides & proteins	24.8 - 24.14		
	F 4/15	Ch 26: Polymers, <b>QUIZ 9</b>	26.1 - 26.3		<b>HW9 due, HW10 open</b>
WEEK 13	M 4/18	Ch 26: Polymer condensations	26.4 – 26.8		
	W 4/20	Exam 4 Review			
	F 4/22	<i>SPRINGFEST – No Class</i>			<b>HW10 due</b>
WEEK 14	<b>M 4/25</b>	<b>EXAM IV (CH 23, 24, 26)</b>			
	W 4/27	Comprehensive Review			
	F 4/29	Comprehensive Review, <b>QUIZ 10</b>			
WEEK 15	M 5/2	Comprehensive Review			
	<b>T 5/3</b>	<b>ACS Organic Chemistry FINAL EXAM (Ch 1-26) 2 HOURS, 1-3 pm</b>			