

Submit originals (including syllabus) and one copy and electronic copy to the Faculty Senate Office  
 See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

**CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL**  
 Attach a syllabus, except if dropping a course.

**SUBMITTED BY:**

Department	Chemistry & Biochemistry	College/School	CNSM
Prepared by	Tom Green	Phone	474-1559
Email Contact	tkgreen@alaska.edu	Faculty Contact	tkgreen@alaska.edu

**1. COURSE IDENTIFICATION: As the course now exists.**

Dept	CHEM	Course #	F322	No. of Credits	3
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COURSE TITLE	Organic Chemistry II
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**2. ACTION DESIRED:**  Check the changes to be made to the existing course.

Change Course	<input checked="" type="checkbox"/>	If Change, indicate below what is changing.	Drop Course	<input type="checkbox"/>
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NUMBER		TITLE		DESCRIPTION	<input checked="" type="checkbox"/>
PREREQUISITES*				FREQUENCY OF OFFERING	

\*Prerequisites will be required before a student is allowed to enroll in the course.

CREDITS (including credit distribution)	4 (3+3)	COURSE CLASSIFICATION	
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ADD A STACKED LEVEL (400/600)	<input type="checkbox"/>	Dept.		Course #	
Include syllabi.					

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online - see URL at top of this page.

ADD NEW CROSS-LISTING	<input type="checkbox"/>	Dept. & No.		Requires approval of both departments and deans involved. Add lines at end of form for additional signatures.
STOP EXISTING CROSS-LISTING	<input type="checkbox"/>	Dept. & No.		Requires notification of other department(s) and mutual agreement. Attach copy of email or memo.
OTHER (specify)				

**3. COURSE FORMAT**

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council and the appropriate Faculty Senate curriculum committee. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

COURSE FORMAT: (check all that apply)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input checked="" type="checkbox"/> 6 weeks to full semester
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OTHER FORMAT (specify all that apply)

Mode of delivery (specify lecture, field trips, labs, etc.)	Lecture + Lab
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**RECEIVED**

SEP 30 2014

Dean's Office

College of Natural Science & Mathematics

Governance  
 10/1/14 TRP

4. **COURSE CLASSIFICATIONS:** (undergraduate courses only. Use approved criteria found in Chapter 12 of the curriculum manual. If justification is needed, attach separate sheet.)

H = Humanities

S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core?

YES

NO

IF YES\*, check which core requirements it could be used to fulfill:

O = Oral Intensive,   
\*Format 6 also submitted

W = Writing Intensive, \*Format 7 submitted

X = Baccalaureate Core

4.A **Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.**

YES   
NO

5. **COURSE REPEATABILITY:**

Is this course repeatable for credit?

YES

NO

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit?

0

TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?

CREDITS

6. **COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking, clearly showing the changes you want made. (Underline new wording ~~strike-through-old wording~~ and use complete catalog format including dept., number, title, credits and cross-listed and stacked.)

Example of a complete description:

PS F450 Comparative ~~Aboriginal~~ Indigenous Rights and Policies (s)

3 Credits

Offered As Demand Warrants

~~Case-study~~ Comparative approach in ~~assessing~~ analyzing Indigenous rights and policies in different nation-state systems. ~~Seven Aboriginal situations~~ Multiple countries and specific policy developments examined for factors promoting or limiting self-determination. Prerequisites: Upper division standing or permission of instructor. (Cross-listed with ANS F450.) (3+0)

CHEM F322 Organic Chemistry II

~~3~~4 credits Offered Spring

A systematic study of the more important function groups of carbon compounds, including their mechanisms of reaction, methods of synthesis, and physical and spectroscopic properties. Lab portion will include synthesis and characterization by spectroscopy. Prerequisites: Chem F321. (3+03)

7. **COMPLETE CATALOG DESCRIPTION AS IT SHOULD APPEAR AFTER ALL CHANGES ARE MADE:**

CHEM F322 Organic Chemistry II

4 credits Offered Spring

A systematic study of the more important function groups of carbon compounds, including their mechanisms of reaction, methods of synthesis, and physical and spectroscopic properties. Lab portion will include synthesis and characterization by spectroscopy. Prerequisites: Chem F321. (3+3)

8. **GRADING SYSTEM:** Specify only one.

LETTER:

PASS/FAIL:

9. **ESTIMATED IMPACT**

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

None. We already teach the lab portion (Chem F323) but this course will become part of Chem F322.

**10. LIBRARY COLLECTIONS**

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	We already teach the course but now Chem 323F lab is rolled into Chem F322
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**11. IMPACTS ON PROGRAMS/DEPTS:**

What programs/departments will be affected by this proposed action?  
Include information on the Programs/Departments contacted (e.g., email, memo)

There will be no impact on the program in Chemistry & Biochemistry or other programs. Chem F323 is being absorbed into Chem F322.

**12. POSITIVE AND NEGATIVE IMPACTS**

Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.

This change will streamline our organic chemistry offerings.

**13. JUSTIFICATION FOR ACTION REQUESTED**


The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Chem F322 will incorporate the curriculum of Chem F323, Organic Chemistry Laboratory, 1 credit, to become 4 credits. Thus the lab is integrated into Chem F322 Organic Chemistry II rather than being separate. Thus, students must take the lab along with the lecture, which was not previously required. We think this more appropriate since organic chemistry is a laboratory science. Chem F322 Organic Chemistry II will become similar to Chem F321 Organic Chemistry I, which also includes a lab.

**APPROVALS: (Additional signature blocks may be added as necessary.)**

	Date	9-18-14
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Signature, Chair, Program/Department of: Chemistry + Biochemistry

	Date	9-30-14
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Signature, Chair, College/School Curriculum Council for: CNSM

	Date	9/30/14
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Signature, Dean, College/School of: CNSM

Offerings above the level of approved programs must be approved in advance by the Provost:

Signature of Provost (if applicable)	Date	
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**ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.**

Signature, Chair	Date	
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Faculty Senate Review Committee: \_\_\_Curriculum Review \_\_\_GAAC

\_\_\_Core Review \_\_\_SADAC

**ADDITIONAL SIGNATURES:** (As needed for cross-listing and/or stacking; add more blocks as necessary.)

	Date	
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Signature, Chair, Program/Department of: \_\_\_\_\_

	Date	
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Signature, Chair, College/School Curriculum Council for: \_\_\_\_\_

	Date	
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Signature, Dean, College/School of: \_\_\_\_\_

Note: If removing a cross-listing, attach copy of email or memo to indicate mutual agreement of this action by the affected department(s). If degree programs are affected, a Format 5 program change form must also be submitted.

**Organic Chemistry II Syllabus**  
**Chemistry 322**  
**University of Alaska Fairbanks**  
**Spring 2016**

**Course Information**

Chemistry F322, Organic Chemistry II, 4.0 Credits

Murie Auditorium, MWF 1:00 – 2:00 pm

Prerequisite: Chem F321, Organic Chemistry I, with grade of C- or better.

**Instructor**

Thomas Green, Professor of Chemistry

Reichardt 174, Phone: 474-1559, Email: [tkgreen@alaska.edu](mailto:tkgreen@alaska.edu)

Office Hours: Tues 1-5 pm, Wed 1-5 pm.

Website: <http://www.uaf.edu/chem/faculty/tgreen/tgreen.htm>

**Course Materials**

**Required:** Text: Wade, Organic Chemistry, 8th edition, Pearson, 2013

**Recommended:** Solutions manual for Organic Chemistry, Wade and Simek, 2012

**Course Description**

This course will focus on the theory of organic chemistry (or chemistry of molecules containing carbon) from the viewpoint of structure/reactivity relationships. Topics covered will be bonding, functionality, reactivity, synthesis, spectroscopy, nomenclature, and computer modeling. Homework and Exams will constitute the majority of the points earned in class. Includes laboratory (see separate syllabus) which constitutes 25% of grade.

**Course Goals**

1. Know reaction chemistry of major functional groups of organic molecules (molecules with carbon).
2. Know how to write mechanisms for organic reactions.
3. Know 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:

1. Understand fundamental concepts of bonding in organic functional groups.
2. Know how to name simple organic compounds.
3. Be able to predict the reactivity of aromatic compounds, alcohols, phenols, aldehydes, ketones, carboxylic acids and their derivatives, and amines.
4. Understand the basic concepts of stereochemistry and apply it to reaction chemistry.
5. Be able to predict and write mechanisms of reactions based on fundamental concepts of acid/base chemistry (nucleophiles and electrophiles).
6. Know how to write out synthetic pathways using the correct order of reactants and reagents in order to arrive at a target molecule.

## Instructional Methods

1. The instructor will lecture on the theoretical aspects of organic chemistry, using a combination of Power Point slides and Chalkboard, providing copies of notes to the students via the web.
2. Selected Online assignments (Sapling) relevant to the course material will also be required, as well as end-of-chapter homework from the text.

## Lecture Schedule and Coverage

Jan 16 - Feb 2; Chapters 16, 17; aromatic compounds and their reactions

Feb 6 - Feb 20; Chapters 18,19; ketones, aldehydes and amines

Feb 25 - Mar 11; Chapters 20,21; carboxylic acids and their derivatives

Mar 23 - Apr 6; Chapters 22,23; carbonyl condensations and carbohydrates

Apr 10 - Apr 22; Chapters 24,25 ; amino acids, peptides and lipids

April 29, May 1, 4 – Review for Final

## Evaluation

### 1. Exams (5 @ 100 pts = 500 pts.)

#### Final Exam 200 pts

Exam 1, Feb 4 (Wed); Chapters 16,17

Exam 2, Feb 22 (Mon); Chapters 18,19

Exam 3, Mar 13 (Fri); Chapters 20,21

Exam 4, April 8 (Wed); Chapters 22,23

Exam 5, Apr 27 (Mon); Chapters 24,25

Final, May 6 (Wed), Comprehensive Final 10:15 am-12:15 pm

### 2. Homework (200 pts)

**Sapling Online (200 pts) - 10 chapters @ 20 pts = 200 pts**

You will need to have login access to the website. <http://saplinglearning.com>

End of Chapter Problems 10 chapters x 15 pts = **150 pts**

### 3. Lecture Point Totals and Grade Assignment

5 hour exams @ 100 pts each = 500 points

Final exam = 200 pts

Sapling HW = 200 points

End of Chapter Homework = 150 pts

Lab = 350 pts (see Lab syllabus, 25% of grade).

Total = 1400 pts

Letter Grade	Points per Credit	Percentage required
A+	4	97
A	4	93
A-	3.7	90
B+	3.3	87
B	3	83
B-	2.7	80
C+	2.3	77
C	2	73
C-	1.7	70
D+	1.3	67
D	1	63
D-	0.7	60
F	0	<60

### Notes and Policies:

1. Molecular models are allowed during the exam. The Final is May 6 (Wed) 10:15am – 12:15 pm in Murie Auditorium
2. Class attendance is expected and role will be taken.
3. Make-up exams are only allowed in the event of a legitimate excuse as determined by the instructor. Oversleeping is not an excuse. Exams must be made up as soon as possible.
4. Cheating will result in a grade of F for the exam.
5. The course will move quickly and it is important to keep up on a daily basis. The best way to do this is to read the text and to work the problems.

### Disabilities Services

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures 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 WHIT, 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 is the Veterans Service Officer at the Veterans Resource Center, 111 Eielson Building, 474-2475. ([wecrary@alaska.edu](mailto:wecrary@alaska.edu)) Fairbanks Vet Center 456-4238. VA Community Based Outpatient Clinic at Ft. Wainwright is 361-6370.

**Chem F322 Organic Chem II Lab Syllabus**  
**University of Alaska Fairbanks, Spring 2016**

**Course Information**

Chemistry F322, Organic Chemistry II Laboratory, 1.0 Credits (part of Chem F322)

Laboratory: Reichardt 245

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

Co-requisite: This course is an integral part of Chem F322, Organic Chemistry II course. You cannot drop the lab without also dropping the lecture (and vice versa).

<b>Sections</b>	<b>Day</b>	<b>Time</b>
76401	Wednesday	2:15 – 5:15pm TA John Harley
76402	Wednesday	6:00 – 9:00pm TA John Harley
76399	Thursday	11:30am – 2:30pm TA Arianna Demmerly
76403	Thursday	2:45 – 5:45pm TA Anil Damarancha
76400	Thursday	6:00 – 9:00pm TA, Anil Damaranch
78943	Friday	2:15 – 5:15pm TA Arianna Demmerly

**Instructor**

Thomas Green, Professor of Chemistry  
Reichardt 174, Phone: 474-1559, Email: [tkgreen@alaska.edu](mailto:tkgreen@alaska.edu)  
Office Hours: Monday 2-5 pm, Tuesday 9am-12 pm

**Teaching Assistants**

Anil Damarancha, Reichardt 163, [ardamarancha@alaska.edu](mailto:ardamarancha@alaska.edu)  
Arianna Demmerly, Murie 113, [ademmerly@alaska.edu](mailto:ademmerly@alaska.edu)  
John Harley, Arctic Health 158C, [john.r.harley@gmail.com](mailto:john.r.harley@gmail.com)

**Course Materials Required:** Lab notebook for recording lecture notes and experimental data. This notebook should have bound pages (not spiral notebook), with line notebook paper (not graph paper). You can purchase one at the bookstore. Experiments procedures will be available on Blackboard. In addition, videos are linked for various experimental techniques.

**Course Description:** The lab component of Chem F322 (4.0 credits). A laboratory designed to illustrate modern techniques of isolation, purification, analysis and structure determination of covalent, principally organic, compounds. Lab portion will include advanced synthetic techniques and spectroscopy. Special fees apply.

**Course Goals.** Learn the following practical aspects of organic synthesis.

1. Common safety procedures.
2. Reaction methods
4. Isolation Procedures
5. Purification techniques
6. Spectroscopic and chromatographic analyses



## Student Learning Outcomes

1. Know the hazards associated with common chemicals, especially those encountered in the experiments.
2. Know how to safely assemble reaction systems using glassware commonly employed in the organic laboratory. These methods include reflux, heating and cooling of reactions, and addition of reagents.
3. Know how to isolate and purify organic products using methods such as extraction, filtration, crystallization, distillation, solvent removal, and thin layer chromatography.
4. Learn the importance of stoichiometry to a chemical reaction. Learn how to assess the efficiency of a chemical reaction (percent yield and atom economy).
5. Learn the practical aspects of spectroscopic analyses of organic compounds.

## Instructional Methods

1. The instructor will lecture on the practical aspects of organic chemistry, using a combination of Power Point slides and Chalkboard, providing copies of notes and reading material to the students via Blackboard. The Lab Schedule will be available on Blackboard and at the end of this syllabus.
2. Laboratory sessions will consist of conducting reactions of organic compounds and their isolation, purification and characterization.
3. Each experiment will require a "Lab Report" which will consist of Pre-lab and Post-lab components. The Pre-lab portion should be completed prior to coming to lab. If it is not completed, you will not be allowed to work in the lab for that day's experiment. Your TA will need to verify with her/his initials that you have completed the pre-lab questions.
4. Quizzes and a Final exam will be offered.
5. Spectroscopic homework will be assigned.
6. Each lab will have an 8 pt quiz based on the pre-lab exercises.

**Laboratory Safety:** Laboratory safety is a major concern of all chemical laboratories but is especially important in organic labs due to the presence of flammable solvents, potentially hazardous fumes, highly reactive reagents, etc. The first lecture will deal explicitly with these hazards and the appropriate safety measures you must follow. Subsequent lectures, besides covering the theory and pitfalls of the coming weeks' experiments and perhaps helping you interpret the previous week's experiment, will also cover specific hazards that you may encounter. Please attend these lectures and be prepared for the lab by doing any assigned readings and completing the Pre-lab exercises before coming to lab. If you are not prepared for lab you may be asked to leave.

## Grading

Category	Points
Lab reports	35 pts x 6 = 210 pts
Quizzes	8 pts x 6 = 48 pts*
Spectroscopic unknowns	3 problems x 14 pts = 42 pts
Final	50 pts
<b>Total Points</b>	<b>350 pts**</b>

\*lowest quiz dropped)

\*\*The total points earned will be averaged into the overall grade for Chem F321 (4 credits).

**Notes and Policies:**

1. Class attendance is expected and role will be taken.
2. Make-up labs will be allowed with a legitimate excuse. Excuses must be approved by the instructor.
3. All labs must be completed to receive a passing grade.
4. You will often be asked to work with another student in pairs. You are expected to contribute equally with your partner in carrying out the experiment. Each student is required to complete and submit a lab report.

**Lab Schedule** – see Blackboard for specific Experimental Procedures and Report Forms.

<b>Experiment</b>	<b>Week of</b>	<b>Concepts/Techniques</b>
1. Diels-Alder Reaction in water	Jan 19	Safe Lab Practices and Policies, Thin Layer Chromatography, Recrystallization, melting point, NMR Spectroscopy.
2. Iodination of Vanillin	Jan 26	Electrophilic Aromatic Substitution, redox, recrystallization, melting point, IR spectroscopy
3. Acetylation of Ferrocene	Feb 2,9	Aromaticity, EAS, TLC, MP, hot filtration, thin-layer chromatography
4. Usnic Acid and Lichens	Feb 16,23	<sup>1</sup> H NMR, rotary evaporation, chromatography, recrystallization, melting point, polarimetry, vacuum filtration
5. Fluorescent Natural Products	Mar 2	Fluorescence, solid phase acids, IR, NMR, pKa
6. Synthesis of tetraphenylporphyrin	Mar 9, 23	Molecular modeling, metalloporphyrin, NMR spectroscopy
7. Gas Chromatography/ Mass Spectrometry; Analysis of Teas	Mar 30 Apr 6	Fragmentation patterns in mass spectrometry, natural products, terpenes
8. Benzoin Condensation using Thiamine	Apr 13	Recrystallization, melting point, NMR
9. Final Exam (50 pts) and Makeup Experiments	Apr 20	Please schedule missed labs with your TA.
10 Makeup Experiments	Apr 27	Please schedule missed labs with your TA.

**Quiz and Exam Schedule**

<b>Week</b>	<b>Quiz/Exam</b>
Jan 26	Quiz 1 on Vanillin Lab (8 pts)
Feb 2	Quiz 2 on Ferrocene (8 pts)
Feb 16	Quiz 3 on Usnic acid (8 pts)
Mar 2	Quiz 4 on Fluorescent products (8 pts)
Mar 9	Quiz 5 on porphyrins (8 pts)
Mar 30	Quiz 6 on Analysis of Teas (8 pts)
Apr 13	Quiz 7 on Benzoin condensation

## Due Dates for Lab Reports and Homework

Experiment	Due Date (Week of)
Diels-Alder	Jan 26
Vanillin	Feb 2
Ferrocene	Feb 16
Usnic Acid	Mar 2
Fluorescent products	Mar 9
Porphyrins	Mar 30
Analysis of Teas	Apr 13
Benzoin	Apr 20

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### **Veteran Support Services.**

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