Chemistry 228 - Organic Chemistry II
Spring 2017: Section 1: T/Th 2:00 PM – 3:20 PM Kivett 206

Dr. Elizabeth Blue
Office: 313 Science Bldg., 910.893.1859
Office Hours: M: 11am -12pm & 2-3 pm; T: 12:30 - 1:30 pm; W: 11am - 12 pm; Th: 9:30 - 11 am & 3:30 - 4 pm; or by appointment
Email: blue@campbell.edu
Please correspond from your CU email address, and allow 24 hours for a response – exceptions may include weekends and holidays.
Website: https://wordpress.campbell.edu/blue/organic/ - bookmark it!
Online discussion, Q&A & Announcements: TBD
Online homework: http://smartwork.wwnorton.com/

Required Course Materials:
- Organic Chemistry: Principles and Mechanisms by Joel Karty. Package from bookstore is $228.55 and includes hardback text, the study guide/solutions manual (answers to the problems in the book), and the Smartwork (online homework) access good for 2 years. There are other purchasing options – see Blackboard or my website for more information.
- Smartwork online homework access (included with package from bookstore, otherwise $25/semester)
- Molecular Model Kit – Indigo Instruments Organic Chemistry Basic Set - more information on Blackboard and my website.
- Safety Goggles (same as Gen Chem ones)
- Lab Notebook - A 9 ¾ in. x 7 ½ in. bound (not spiral bound or perforated) composition notebook is required for the lab. (you can use the same one you used for Organic I)
- Scientific Calculator: An inexpensive scientific calculator is required for this course and lab. Learn how to use it as soon as possible!

Course Resources: My office hours, the discussion group for announcements, Q&A, & discussion (more information coming soon), my website for files (URL above), the study group you form, the books on reserve in the library, the SI sessions, the Tutoring Center, free tutors available through Student Success, and BlackBoard (grades). Many students have found Khan Academy web lectures and others to be useful.

Prerequisite: A grade of C or better in CHEM 227 (or equivalent) is required.
Course Objectives: Students successfully completing Chemistry 228 will demonstrate an understanding of:
- how spectroscopy is used to determine the identity, structure and quantity of organic compounds;
- organic oxidation and reduction reactions;
- conjugated pi systems;
- physical properties, chemical properties, nomenclature, and reactivity of: alcohols and ethers; aromatic compounds, ketones and aldehydes, and carboxylic acids and derivatives.
- Single- and multi-step organic synthesis techniques and the logic involved in designing a synthesis.

Attendance: Attendance is required. According to university policy four (4) absences is considered the maximum number of "cuts" for this class. More than four (4) cuts result in an "F". Regardless of the policy, poor attendance typically translates into poor student performance. An absence is an absence.
Grading:

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Tests (3) – 15% each</td>
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<td>45%</td>
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<tr>
<td>Homework</td>
<td></td>
<td>5%</td>
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<td>Quizzes &amp; In-Class Questions</td>
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<td>Final Exam</td>
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<td>Laboratory</td>
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<td><strong>Total</strong></td>
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<td>100%</td>
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Grading is based on the 10-point scale. Therefore, with a 90 average a student earns an A. **There are no make-up tests.** Any missed exams will be recorded as a 0. In the calculation of your final grade, if your final exam score is greater than one of the regular semester tests, the final exam score will be substituted for the (one) lowest regular test grade. The final exam is a standardized final exam written by the American Chemical Society (in a collaboration of a bunch of Organic Chemistry Professors).

**Course Outline**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Review on your own : Acids/Bases (Ch. 6), Ch. 7, 8, &amp; 9</td>
<td>Some Ch. 13 &amp; 19</td>
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<tr>
<td>Unit 1: Introduction to Organic Synthesis &amp; Multi-step Reactions</td>
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<tr>
<td>Nomenclature 4 (will be introduced over the course of the semester)</td>
<td>N4</td>
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<tr>
<td>Nucleophilic Substitution and Elimination Reactions - Synthesis</td>
<td>10 (all)</td>
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<tr>
<td>Electrophilic Addition to Non-Polar Pi Bonds I (w/ Brønsted acid)</td>
<td>11 (all)</td>
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<tr>
<td>Electrophilic Addition to Non-Polar Pi Bonds II (cyclic transition states)</td>
<td>12 (all)</td>
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<tr>
<td>Organic Synthesis I</td>
<td>13 (all)</td>
</tr>
<tr>
<td>Orbital Interactions II: Pi systems, conjugation, &amp; aromaticity + UV/Vis</td>
<td>14 (all)+15.1-15.3</td>
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<tr>
<td>Electrophilic Aromatic Substitution I: benzene</td>
<td>22 (all)</td>
</tr>
<tr>
<td>Electrophilic Aromatic Substitution II: substituted benzenes</td>
<td>23.1-23.9; 23.11-23.14</td>
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<tr>
<td>Nucleophilic Addition to Polar Pi Bonds I: strong nucleophiles</td>
<td>17 (all)</td>
</tr>
<tr>
<td>Nucleophilic Addition to Polar Pi Bonds II: catalyzed</td>
<td>18 (all)</td>
</tr>
<tr>
<td>Organic Synthesis II</td>
<td>19 (all)</td>
</tr>
<tr>
<td>Nucleophilic Addition-Elimination Reactions I: strong nucleophiles</td>
<td>20 (all)</td>
</tr>
<tr>
<td>Nucleophilic Addition-Elimination Reactions I: weak nucleophiles</td>
<td>21 (all)</td>
</tr>
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**Test Dates:**

Test 1: Tuesday, February 7th

Test 2: Tuesday, March 21st

Test 3: Thursday, April 20th

American Chemical Society (ACS) Cumulative Final Exam:
Monday, May 1st, 12:00 PM – 2:50 PM

***This schedule is tentative, however, every effort will be made to hold exams as listed***

Last Day to Drop: Thursday, February 2nd; Last Day to Withdraw: Tuesday, March 21st

**Laboratory:** Registration for lab is **required** in this course. Labs will reinforce the material covered in class by "hands-on" experience. Regardless of your grade in lab or lecture, failure to attend lab and turn in required work will result in failure of the lab and the course. **You cannot receive credit for CHEM 228 without passing CHEM 228L laboratory. I will typically allow students to use a recent, regular semester Organic II Lab grade (228L). If you wish to use your old lab grade, you MUST confirm your lab grade with me as soon as possible.**

**Homework & Reading:** Expect to spend at least two hours (for every hour in class or lab) preparing for this course. I will expect that you are reading the assigned reading, and any information in the assigned readings is testable material, whether we have covered the material in class or not. I recommend that you take brief notes as you read to keep yourself engaged. After material has been covered in class, make brief study sheets, flash.
cards, or quizlets for yourself which include a simple version of the reaction and critical information about the reaction: regiochemistry & stereochemistry as appropriate, mechanism “signposts”, reagents, & special considerations. Review these study sheets regularly to internalize this information. The first time I taught Organic II, I made similar study sheets and made copies where I had whitewashed-out different information in order to quiz myself. You must know the reactions and reagents backwards and forwards – they are your Organic Chemistry alphabet.

I will assign in-book homework problems after every class period. It is to your advantage to do all homework only relying on your knowledge and your study sheet as needed. Avoid relying heavily on the Notes/Textbook/Solutions Manual as you work problems – just use it to check your work afterwards. Everything is easy when you know how to do it. Make sure YOU know how to do the problems. Come see me early and often for any questions/problems with the course material.

There will also be online homework on SmartWork and occasionally, paper-based homework that you will turn in. I strongly recommend working your problems out on a piece of paper, USING THE MECHANISM, before submitting an answer to the SmartWork system. This will help reduce frustration with the system and hopefully help you arrive at the right answer sooner. Many students have found the use of small- or medium-sized whiteboards to be very helpful when working problems and studying for this course. Most Smartwork will give 5 chances, and multiple-choice questions will deduct points.

Quizzes & In-class questions: There will be quizzes on the reactions or nomenclature information about once a week or every other week. These will take the form of “fill in the blank”. Usually the blank will be for the reagents or the product, with the substrate given. Also, we will do some in-class work, often in groups, and I will often call on students individually to report their answers. Expect to be called on at least once this semester. In-class questions are graded largely on an “effort” basis.

“Molecule of the week”: Occasionally, information about a particular molecule or a short article from a recent chemical journal will be presented in class. Questions about these brief presentations may be included on the following tests.

Drop/Withdrawal Dates: Thursday, February 2nd is the last day to drop without receiving a grade. According to university policy, courses dropped after February 2nd and before March 21st will receive a grade of W (withdrawn). Courses withdrawn from after Tuesday, March 21st will receive an ’F’ unless the withdrawal is from the university for documented medical emergencies or military deployments.

Honor:

All members of the University community are expected to be “honest in all behavior.” In accordance with the University Catalog (http://www.campbell.edu/pdf/academics/CU_Academic_Conduct_Final_5-02-12.pdf), each student of Campbell University is expected to personally demonstrate academic integrity.

Examples of academic misconduct include (but are not limited to – see full policy): copying results or information from another student’s lab report or notebook, communicating in any way with another student during an exam or quiz, using any sort of unauthorized information, in electronic, paper, or other form. Obtaining information about a test in advance of a test or sharing information about a test with another student before you or they have taken the test. Be very vigilant in lab that you are doing your own work/writing and not over-collaborating or allowing anyone to inadvertently or intentionally copy you.

Conduct: Be proactive. Come see me if you are starting to feel lost with the material, or as soon as possible. Treat others in the class with respect and maintain an atmosphere conducive to thinking and learning. Keep tardiness and moving in and out of the classroom to a minimum. If you must come late or leave early for a legitimate reason, please sit near the entrance. Cell phones or other distracting devices are prohibited. Laptop computers are allowed, but users must sit in the back row to minimize classroom distractions. If you prefer to sit closer to the front, then you must turn off your wi-fi access.

Student Success: Student Success aims to provide tutoring or other support programs to all students for any course offered on main campus. Assistance with choosing a major and preparing for the job or internship search
process is also available through this office. See the Student Success website (www.campbell.edu/success) for details.

CU Tutoring Center: The CU Tutoring Center provides tutoring for this course. Tutors are available to meet with students individually or in small groups at the Tutoring Center, which is located on the third floor of Wiggins Library, 7-10 p.m. Sunday-Thursday. No appointment is needed. More information is available at www.campbell.edu/success.

Disability Services: Students with documented disabilities who desire modifications or accommodations must contact the office of Student Success located in the University’s Student Services Building (between Carter Gym and the Wallace Student Center). No accommodations will be made without approval through the University’s process. A medical, psychological or other diagnosis may rise to the level of a disability if it substantially limits one or more major life functions, one of which is learning. A disability may be temporary or ongoing. Please contact Student Success for more information if you believe you may need services.

Counseling Services: All campus undergraduate students can receive free confidential counseling through Counseling Services. To make an appointment, visit the office located at 233 Leslie Campbell Avenue (brick house beside Memorial Baptist Church and across from Bob Barker Hall) or call 910-814-5709.

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<tr>
<th>For academic and disability services:</th>
<th>For counseling services:</th>
<th>For academic support &amp; career development:</th>
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<tbody>
<tr>
<td>Laura Rich</td>
<td>University Counseling Services</td>
<td>Betsy Dunn-Williams, Director of Academic Support and Career Development</td>
</tr>
<tr>
<td>Director of Access and Outreach</td>
<td>233 Leslie Campbell Avenue (brick house beside Memorial Baptist)</td>
<td>Student Services Building, room 111</td>
</tr>
<tr>
<td>Student Services Building, room 113</td>
<td>910-814-5709</td>
<td>910-814-5707, <a href="mailto:bwilliams@campbell.edu">bwilliams@campbell.edu</a></td>
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General Description: This second organic course will emphasize patterns of reactivity associated with various classes of compounds organized by functional group. This course plays a role in the larger mission of Campbell University. In particular Chemistry 228 will:

- present a worldview informed by Christian principles and perspectives;
- transfer to students the vast body of knowledge and values accumulated over the ages;
- encourage students to think critically and creatively;
- influence development of moral courage, social sensitivity, and ethical responsibility;
- deliver academic instruction in the liberal arts and sciences and professional preparation;
- foster the development of intellectual vitality, physical wellness, and aesthetic sensibility;
- forge a community of learning that is committed to the pursuit, discovery, and dissemination of knowledge;
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