

Instructor: Dr. Nolan Carter

Office: 201B Laney Hall

Phone: 450-5941

Email: Ncarter@uca.edu (put CHEM 3411 in subject line)

Webpage: Course materials are posted on Blackboard

Lecture: M,W, F 11:00 - 11:50 AM Laney 102

Lab: Th 8:00-10:40 AM (CRN 20420) Laney 306
10:50-1:30 PM (CRN 28261)
2:40-5:20 PM (CRN 20427)

Office hours: M, W 1:30-2:30 PM
T 12:30-1:30 PM
F 9:30-10:30 AM
or by appointment

If I'm not in the office, check my research lab (Laney 204).

Required course materials:

Organic Chemistry, 4th ed., Janice Gorzynski Smith, McGraw-Hill, 2014.

Turning Point RF-LCD Response Pad ("clicker")

CHEM 3411 Laboratory Procedures (posted on Blackboard)

Laboratory notebook

Safety goggles

Optional Course Materials:

Student Study Guide/Solutions Manual for use with Organic Chemistry (4th ed.), Janice Gorzynski Smith.

Molecular model set

Course Description and Objectives:

CHEM 3411 (Organic Chemistry II) is the second part of a two-semester sequence that begins with CHEM 2401 (Organic Chemistry I). Topics covered in CHEM 3411 include oxidation/reduction, radical reactions, structure and reactivity of aromatic compounds, carbonyl compounds, carboxylic acid derivatives, and amines. Interpretation of ¹³C NMR and ¹H NMR spectra will be covered in both lecture and lab. Emphasis will be placed on understanding the mechanisms of organic reactions.

Prerequisite:

A grade of "C" or better in CHEM 2401 (Organic Chemistry I) is required to take CHEM 3411 (Organic Chemistry II).

Attendance Policy:

Lecture attendance is strongly encouraged. Given the large amount of material we will cover, it will be extremely difficult to be successful in this class if your attendance is poor. Makeup exams and quizzes will not be given unless the reason for absence is an officially sanctioned UCA activity (it is your responsibility to provide me with documentation at least one week prior to the exam or quiz). For all other absences, if you contact me prior to an exam with a valid excuse (documented serious illness, etc.) that exam will be dropped and your exam grade will be based upon your other exam scores (including the final exam). Missing an exam without an acceptable excuse will result in a grade of "0".

Class disruptions will not be tolerated. Phones must be turned to silent prior to class. Text messaging, talking, and consistent tardiness are also considered disruptive. Penalties for disruptive behavior may range from a deduction of participation points to a "WF" grade for the course.

Laboratory attendance is required. If a laboratory experiment is missed for acceptable reasons (official UCA activity, serious documented illness, etc.), the missed lab experiment will be made up or dropped at the instructor's discretion. If a laboratory experiment is missed without an acceptable excuse, a grade of "0" will be assigned. Tardiness for lab may result in a deduction of points or a grade of "0".

Americans with Disabilities Act:

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation due to a disability, please contact the UCA Office of Disability Services.

Other UCA Policies:

You should familiarize yourself with policies listed in the UCA Student handbook (<http://uca.edu/student/student-handbook/>), particularly those relating to academics and sexual harassment.

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the *Student Handbook*. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on those specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>. **Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.*

How to Be Successful in This Class:

1. **Come to class prepared.** Read through the material we will cover in lecture **before** class. Identify the material that you think is hard to understand and come prepared to ask questions about it. PowerPoint presentations will be posted on Blackboard-print these out and bring them to class. I recommend bringing the full-size versions to class to allow plenty of room for note taking.
2. **Participate in class.** Class should be a dialogue not a monologue. In other words, don't be afraid to ask questions and answer questions I ask. Your clicker responses are important because they let me know if I am moving too rapidly or too slowly. If I say something that doesn't make sense, **stop me**. I don't mind being interrupted-that way I know you are paying attention.
3. **The suggested problems are STRONGLY suggested!** In order to truly grasp the material we cover, you will need to develop your skills by working problems from your textbook. The problems may seem easy when you watch me work them in class, but if you don't practice on your own they won't seem very easy on the day of the exam. Here are some tips on how to approach the suggested problems:
 - Review your notes to make sure you understand the concepts we have covered before attempting the problems.
 - Before attempting the suggested problems, make sure you understand the example problems in the textbook. These problems are similar to the assigned problems but have solutions provided.

Working questions from old exams and quizzes is also a helpful way of gauging your understanding of the material. Don't look at the answer key until after you have attempted the problems.

4. **Don't get behind!** You have probably heard the saying that you should spend 2 hours studying for every hour in lecture. This is actually true for this course. This means a **minimum** of 6 hours outside of class each week just working problems and going over lecture material. If you wait until the day before the test to start the suggested problems it will be too late.

5. **Keep in mind that the course is comprehensive.** Although the only exam that is officially "comprehensive" is the final exam, you can't forget the chapter 12 material and expect to understand what is going on when we get to chapter 20.

6. **Know when to seek help.** If you are having trouble with the course or have a question, stop by my office. If you are having trouble, don't wait until April to ask for help-by then it will be too late!

Grading:

Your grade in this course will be based upon your performance in lecture and laboratory. **The lecture portion of the course is worth 75% of the total grade and the laboratory portion is worth 25%.** Your lecture grade will be based upon your scores on 4 exams, a comprehensive final, 4 quizzes, and clicker participation. The laboratory grade will be based upon your prelab quizzes, lab notebook, attendance, effort, technique, and the interpretation of your experimental results (see laboratory grade section for further details). The point values and numbers of assignments in the table below are tentative and are subject to change.

Lecture	Points	Laboratory	Points
4 Exams (100 pts each)	400	6 one-week experiments (25 points each)	150
Best 4 of 5 Quizzes (25 points each)	100	2 two-week experiments (30 points each)	60
Final Exam (Comprehensive)	200	2 dry labs (15 points each)	30
Participation	50	Orientation/Policy Review	5
Total	750		245

$$\text{Your Grade} = \left(\frac{\text{Your Lecture Points}}{\text{Total Lecture Points}} \right) (75) + \left(\frac{\text{Your Lab Points}}{\text{Total Lab Points}} \right) (25)$$

Tentative Grading Scale

Percentage	Letter Grade
90-100	A
80-89	B
70-79	C
60-69	D
≤ 59	F

Exams: The four exams will consist of questions similar to the suggested problems and material covered in class. Material from the laboratory may also be covered on exams. The best way to prepare for the exams is to work as many problems as you can. The suggested problems are the minimum amount you should work. Use the old exams posted on Blackboard to get an idea of exam length and what types of questions will be asked. No exam will be dropped. Calculators may not be used.

Quizzes: Quizzes will be announced at least one class period in advance. The lowest quiz will be dropped. If you are absent the day of a quiz, that will count as your dropped quiz (unless the reason for absence is an officially sanctioned UCA activity).

Final Exam: The cumulative final exam will be given on Monday, April 25 from 2:00 to 4:00 PM.

Clicker Participation Grade:

The participation component of your lecture grade (50 points) will be based upon the percentage of clicker questions you answer during the semester regardless of whether your answers are correct or incorrect. For example, if we go over 100 clicker questions during the course of the semester and you answer 90 of these questions, your participation grade will be 45 (90% of the 50 points possible). If you forget to bring your clicker to class or are absent, you will not receive participation credit for that day of lecture. **There are no excused absences except for official UCA-sanctioned activities.**

Participation bonus: A 10 point bonus will be added to the lecture grade of those who actively participate in class. The extent of participation will be defined by the number of days you answer at least one question in class with the clicker. Missing class (or not bringing your clicker) more than 2 times during the course of the semester results in a loss of these bonus points. The 10 point bonus is all-or-nothing.

You must provide me with your clicker device ID in order to receive participation credit. This number can be found on the back of your clicker. Either provide this information in the survey at the end of this document or send it to me via email.

Laboratory Safety:

During the course of the semester, you will be working with a wide variety of organic chemicals. Many organic chemicals are hazardous—they can be toxic, carcinogenic, caustic, or flammable. You should handle all organic chemicals carefully. Disregarding safety practices will result in dismissal from lab and a grade of “0” for the day. The most important aspect of safety in an organic chemistry laboratory is eye protection. Safety glasses must be worn at all times. You will not be allowed to attend lab if you do not have safety glasses. Open-toed shoes such as sandals may not be worn in lab. You will not be allowed to attend lab if you are dressed inappropriately. The balances and other common areas should be kept clean and orderly. Failure to maintain an orderly laboratory may result in a deduction of points from the entire class.

Laboratory Policies and Grading:

- 1. Prior to most experiments (see lab schedule on page 6), a short quiz will be given at the beginning of the laboratory period.** The prelab quizzes are designed to make sure that you do the required reading before the lab. Both the background/theory sections and the procedure sections of the lab handout should be read to prepare for the quiz. The important physical properties (is the reactant a liquid or a solid?) and hazards (are the solvents you will be using toxic?) are fair game. The prelab quiz will start promptly at the scheduled start time of the lab and will only take about 5 minutes. Quizzes cannot be made up, so arriving to laboratory late will result in a grade of “0” for the quiz.
- 2. Note that some sections of the laboratory notebook write up (purpose, chemical reaction/structures, chemical information) must be completed prior to lab (see table on the following page).** The yellow sheet(s) containing these sections must be turned in at the beginning of the laboratory period. This section of the notebook is worth 5 points. This section must be turned in immediately after you arrive. Late papers will not be accepted.
- 3. The procedure, observations, and postlab questions are due one week after the experiment is completed.** Notebook pages should be stapled together in order followed by the postlab questions (which are answered directly on the handout). All spectra (NMR, IR, etc.) should be included.
- 4. Part of your lab grade will be based on technique.** In the lab, you need to be paying attention to what you are doing. During lab, you will be evaluated on your degree of preparation; adherence to safety rules; ability to follow directions; ability to set up and use the apparatus properly; the degree to which you are able to isolate pure product in a reasonable yield. Points may be deducted for deficiencies in this area.

Blackboard:

Class materials such as lab procedures, suggested problems, slides, and exams from previous semesters will be posted on the Blackboard page for this course.

**Approximate
point values**

Page Headers	The title of the experiment is shown on every page.	~ 1 point
	Your lab day/time is written on every page.	
	The correct date is written on every page.	
	The full name of your lab partner is written on every page.	
	Your name is written on every page.	

These sections must be completed prior to laboratory and turned in at the beginning of the lab period. Failure to complete these sections will result in a deduction of 5 points.

Purpose	A purpose for the experiment is written as the first item. What is the overall goal of the experiment? How will you accomplish this goal? Briefly (several sentences) summarize this in your own words.	~ 1 point
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Chemical Information	If you are doing a separation or characterization, show the structures of the compounds you are separating.	~ 3 points
	If you are doing a reaction, the ACTUAL reaction should be shown. Don't show a generic or unrelated example of the reaction.	
	Safety concerns should be summarized in your notebook.	
	Physical constants (molar mass, bps, mps, etc) provided in the lab module should be copied into your notebook.	

Procedure	Write on the left side of the center dividing line in your notebook. Double space your entries. The procedure should be written as a summary of steps taken. You do not need to write in complete sentences.	~ 5 points
	Write down the steps as you perform them. Your procedure should be detailed enough that another person could repeat your experiment without referring to a lab manual. Write in past tense.	

These sections must be completed during the experiment. All information should be recorded directly into the notebook, not elsewhere then transferred to the notebook later. These sections will be worth more points (20 total) for two-week experiments.

Observations	Record observations on the right side of the center dividing line in your notebook. Write down what you see: color changes, bubbling, precipitate formation, product color and texture, etc. Another person repeating your work would want to know this information. Use correct spellings ("percipitate" and "yeild" are not words). Do not use nonstandard abbreviations.	~ 5 points
	Record the units of all measurements. Clearly identify what all quantities refer to (e.g., don't just write 10g, write 10g of NaCl).	
	Show all work for calculations so readers can follow your reasoning. Use significant figures correctly and record EVERY digit from the balance when you determine a mass. All numbers in your calculations should include the appropriate units and chemical names.	

Postlab Questions	All postlab questions should be completely answered on the sheets provided in the lab module. Do not write answers in your notebook.	~ 5 points
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This section should be completed after the experiment.

Miscellaneous	Use correct spelling and grammar.	point deductions vary
	Your notebook should be neat and organized.	
	Staple the report in the correct sequence.	
	Do not write directly on the yellow sheets.	
	You should use proper lab technique and follow all safety rules.	
	Your product should be pure and isolated in a reasonable yield.	
	Staple all spectra (NMR, IR, etc.) to your notebook pages.	

Tentative Lecture and Lab Schedule

Week	Lecture	Lab
1/7-1/8	Ch. 12 Oxidation and Reduction	No Lab
1/11-1/15	Ch. 12 cont.	Orientation, Lab Policy Review (notebook not required, no prelab quiz)
1/19-1/22	Ch. 14 NMR Spectroscopy	Cannizzaro Reaction
1/25-1/29	Ch. 14 cont. Ch. 15 Radical Reactions	NMR (notebook not required, no prelab quiz)
2/1-2/5	Ch. 15 cont. Exam 1 Wednesday 2/3 (Ch. 12, 14, 15) Ch. 16 Conjugation, Resonance & Dienes	Mass Spectrometry (notebook not required)
2/8-2/12	Ch. 16 cont. Ch. 17 Benzene and Aromatic Compounds	Diels-Alder Reaction, Part 1
2/15-2/19	Ch. 17 cont. Ch. 18 Electrophilic Aromatic Substitution	Diels-Alder Reaction, Part 2 (no prelab quiz)
2/22-2/26	Ch. 18 cont. Ch. 19 Carboxylic Acids Exam 2 Friday 2/26 (Ch. 16-18)	Electrophilic Aromatic Substitution: Iodination of Salicylamide
2/29-3/4	Ch. 19 cont., Ch. 25 Amines Ch. 20 Intro to Carbonyl Chemistry	Heck Reaction
3/7-3/11	Ch. 20 cont. Ch. 21 Aldehydes and Ketones	Wittig Reaction
3/14-3/18	Ch. 21 cont. Ch. 22 Carboxylic Acid Derivatives Exam 3 Friday 3/18 (Ch.19-21)	Polymers, Part 1
3/21-3/25	Spring Break	No Lab
3/28-4/1	Ch. 22 cont.	Polymers, Part 2
4/4-4/8	Ch. 23 α -Substitution of Carbonyl Cmpds. Ch. 24 Carbonyl Condensation Reactions	Pechmann Condensation
4/11-4/15	Ch. 24 cont. Exam 4 Wed 4/13 (Ch. 22-24) Ch. 31 Polymers	Reductive Amination
4/18-4/22	Ch. 31 cont.	No Lab
	Final Exam 2:00-4:00 PM Monday, April 25	

Note that exam dates are tentative and will likely change

Important Dates: 3/18 Last day to drop with a “W”
 4/15 Last day to drop with a “WP” or “WF”

Name _____ (let me know if you don't go by your first name)

Clicker device ID _____

CHEM 3411 Organic Chemistry 2
Class Survey Spring 2016

1. What is your major?
2. What are your career plans?
3. When did you take CHEM 2401 (Organic Chemistry I)?
4. Who was your instructor for CHEM 2401?
5. What was your grade in CHEM 2401?
6. Based on your experience in CHEM 2401, do you have any concerns about CHEM 3411?
7. Anything else you'd like to tell me about yourself? Hobbies, interests, extracurricular activities, etc.