# CHEM 2401 Organic Chemistry I Fall 2019

**Instructor**: Dr. Gregory Naumiec **Office**: 130 Laney-Manion Annex **Email**: gregn@uca.edu **Phone**: 852-0692

**Google Classroom**: classroom.google.com **Google classroom code**: saylps

**Website**: https://sites.google.com/a/uca.edu/naumiecgroup/home

| | | | |
|---|---|---|---|
| **Lecture**: | MWF | 8:00 AM – 8:50 AM | Laney-Manion 104 |
| **Lab**: | W (CRN10535)<br>F (CRN10536) | 2:40 PM – 5:30 PM<br>2:00 PM – 4:50 PM | Laney 306 |
| **Office hours**: | MT | 9:00 AM –11:00 AM | |
| | Or by appointment | | |

## What will I learn in this course?

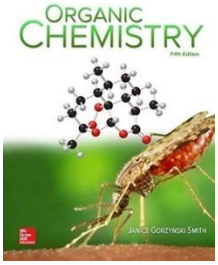
This is the first half of a two-semester sequence which is continued with CHEM 3411 (Organic Chemistry II). CHEM 2401 will introduce you to the field of organic chemistry as well as life in an organic chemistry laboratory. The topics covered in this course include, but are not limited to the following:

- Structure of organic molecules
- Nomenclature
- $^{13}C$ NMR spectroscopy
- Organic reactions and their mechanisms involving:
  - Alkanes
  - Alkyl halides
  - Alcohols, epoxides, and ethers
  - Alkenes and alkynes

## What are the objectives of CHEM 2401?

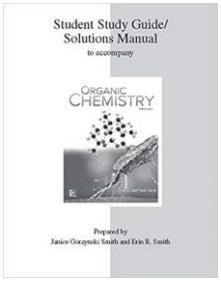
- ✓ Achieve a good working knowledge of of the general field of organic chemistry.
- ✓ Introduce you to life in an organic chemistry laboratory in which you will continue to develop good safety habits, record keeping skills, and laboratory skills.
- ✓ Translate the ideas/concepts that you learn in lecture into the laboratory in order to better understand the underlying concpets of the experiments.
- ✓ Successful completion of this course should be able to prepare you for CHEM 3411 (Organic Chemistry II) and start preparing you for organic chemistry graduate school entrance exams as well as the organic chemistry sections of the MCAT, PCAT, and DAT.

## Required course materials:




- *Organic Chemistry, 5th ed.*, Janice Gorzynski Smith, McGraw-Hill, 2017.
  (***This is a great book to add to your collection***!)
- CHEM 2401 Laboratory Procedures (posted on Google Classroom)
- Laboratory notebook (with carbonless copy paper)
- Safety goggles (ANSI Z87+)
- Molecular Model Kit

## Optional Course Materials:




- *Student Study Guide/Solutions Manual for use with Organic Chemistry (5th ed.),* Janice Gorzynski Smith.
  (***Available in the library and in my office***.)

## Prerequisite:

- ✓ Successful completion (*C or better*) of Chemistry 1451 (or an approved equivalent course).

## How can I be successful in this course?

- ✓ Read the appropriate chapters before coming to class so you can be prepared with any questions you have.
- ✓ Class participation is encouraged. Please ask questions if need further help understanding something. Chances are, someone else in the class has the same question.
- ✓ Do the assigned homework problems. The only way to know if you truly understand the material is if you can solve the problems by yourself.
- ✓ Visit me during my office hours (or make an appointment) if you need help with the material. Your success is important to me.

## Attendance Policy:

Lecture attendance is strongly encouraged, organic chemistry is a very difficult subject to learn on your own. **Makeup exams and quizzes will not be given**. In the event of a valid excuse (UCA sanctioned activity) the next exam/quiz will count as double. 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 or quiz with a **valid** excuse (documented serious illness, etc.) the next exam/quiz will count as double. **Missing an exam/quiz without an acceptable excuse will result in a grade of "0".**

Disruptive behavior: Ringing phones, text messaging, and talking, are considered disruptive to me and your classmates. **Tardiness is particularly disruptive to the class**. Penalties for disruptive behavior may range from dismissal from class for the day, deduction of points, to an "F" 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 score will be dropped. If a laboratory experiment is missed without an acceptable excuse, a grade of "0" will be assigned. Late arrival to lab may result in a grade of "0" or a lowered lab grade. Missing more than one laboratory experiment without a documented excuse may result in a "F" grade for the course. **Passing the laboratory section of the course is required to pass the overall course.**

## Grading:

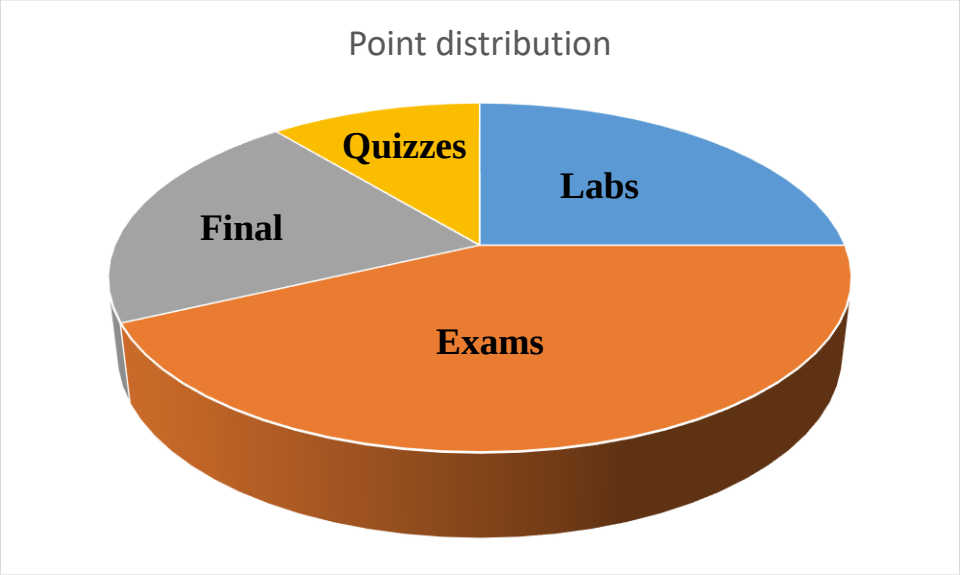
Your grade in this course will be based upon your performance in lecture (75%) and laboratory (25%).

| Lecture | Points | Laboratory | Points |
|---|---|---|---|
| *Exams (4)* | 100 pts each | *Orientation/O. Chem. I Review* | 10 pts |
| *Quizzes (5)* | 20 pts each | *Dry labs (4)* | 15 pts each |
| *Final Exam* | 200 pts | *One-week experiments (7)* | 25 pts each |
| | | | |
| **Total** | **700 pts** | | **245 pts** |

**Tenative Grading Scale**

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

**To calculate your grade:** course% = (0.75*lecture%) + (0.25%*lab%)




**Homework:** Homework will be assigned from each chapter, but will not be collected/graded. It is highly recommended that you complete the homework assignments as their difficulty level will be representative of exam/quiz questions.

**Quizzes:** Quizzes will be given at the beginning of class. If you are absent or late to class the day of a quiz, you will receive a grade of 0 on the quiz.

**Exams:** There will be 4 exams as well as a comprehensive final exam (**Wednesday December 11th, 8 am – 10 am**). ***What is learned during the lab experiments may appear on exams.***

## Laboratory Safety:

Laboratory safety is the primary concern when working in a laboratory. During the course of the semester, you will be working with a wide variety of organic chemicals. These can be toxic, carcinogenic, caustic, or flammable. Make sure to always wear the proper personal protective equipment (PPE) - safety glasses and closed toe/heel shoes. You will not be allowed to attend lab without the proper PPE. Handle all organic chemicals carefully. Disregarding safety practices will result in dismissal from lab and a grade of "0" for the day. **Prior to performing any laboratory work, you must review and sign the CHEM 2401 lab safety agreement**.

The lab safety agreement is located at: https://uca.edu/web/forms/view.php?id=978

## Laboratory Policies and Grading:

1. Lab experiments are worth either 15 or 25 points, depending upon whether or not a lab notebook write-up is required and the length of experiment (see lab schedule).

2. Some sections of the laboratory notebook write up (**purpose, chemical reaction/structures, chemical information**) must be completed **prior to lab**. The yellow sheet(s) containing these sections must be turned in at the beginning of the laboratory period. Failure to turn this section in will result in a deduction of 5 points (out of the possible 25). This section must be turned in immediately after you arrive. Late papers will not be accepted.

3. The remaining yellow notebook pages (containing your procedure, observations, etc.) are due at the end of the lab meeting. Late papers may be accepted for reduced credit.

4. Postlab questions are due one week after the experiment ends.

5. Points may be deducted for poor technique. In the lab, you need to be paying attention to what you are doing. During lab, the instructor will evaluate how well each student is prepared for the lab; follows safety rules; keeps his/her workspace neat; sets up and uses the apparatus properly; is efficient; is able to perform the experiments; works within the group; uses the equipment properly; isolates pure product and (to a lesser extent) in high yield.

## Lab Procedures- Google Classroom:

Lab procedures will be posted on the Google Classroom page for this course (classroom.google.com). Please print out the necessary lab procedures ahead of time and bring them with you to each lab.

| | | 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. | |
| **Purpose** | A purpose for the experiment is written as the first item. What is the overall goal of the experiment? How will your accomplish this goal? Briefly (several sentences) summarize this in your own words. | **~ 1 point** |
| **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.<br><br>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.<br><br>Write in past tense, no pronouns. | **~ 5 points** |
| **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. | **~ 5 points** |
| | Do not use nonstandard abbreviations. | |
| | 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 lab module print out. | **~ 10 points** |
| **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. | |

**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.**

**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 are due at the end of the lab.**

**This section is due one week after the experiment ends.**

# Tentative Lecture and Lab Schedule

| Week | Monday | Wednesday | Friday | Lab |
|---|---|---|---|---|
| 8/22-8/23 | | | **1st day of Class**<br>CH 1, Structure and Bonding | **No lab meetings this week** |
| 8/26-8/30 | CH 1 cont. | CH 1 cont. | CH 1 cont. | Check In, Safefy/ Review |
| 9/2-9/6 | **Labor Day**<br>**No classes** | CH 1 cont. | CH 2, Acids and Bases<br>**Quiz 1, 9/6** | Natural Dyes |
| 9/9-9/13 | CH 2 cont. | CH 2 cont. | CH 2 cont. | IR Spectroscopy<br>*(notebook not required)* |
| 9/16-9/20 | CH 3, Intro to Organic Molecules | CH 3 cont.<br>CH 4, Alkanes | **Exam 1 (CH 1 – 3) 9/20** | Thin Layer Chromatography |
| 9/23-9/27 | CH 4, cont. | CH 4 cont. | CH 4 cont. | $^{13}$C NMR Spectroscopy<br>*(notebook not required)* |
| 9/30-10/4 | CH 5, Stereochemistry | CH 5 cont.<br>**Quiz 2, 10/2** | CH 5, cont. | Stereochemistry<br>*(notebook not required)* |
| 10/7-10/11 | CH 6, Organic Reactions | CH 6 cont. | CH 7, Alkyl Halides and Nucleophilic Substitution | Melting Points and Green chemistry (two labs this week) |
| 10/14-10/19 | CH 7 cont. | **Exam 2 (CH 4 – 6) 10/16** | **Fall Break**<br>**No classes** | **No lab meeting this week** |
| 10/21-10/25 | CH 7 cont. | CH 7 cont. | CH 7 cont. | **No lab meeting this week (INBRE research conference)** |
| 10/28-11/1 | CH 8 Elimination Reactions | CH 8 cont.<br>**Quiz 3, 10/30** | CH 8 cont. | Nucleophilic Substitution |
| 11/4-11/8 | CH 9, Alcohols, Ethers, and Epoxides | **No class meeting, INBRE Conference** | **Exam 3 (CH 7 – 8) 11/8** | **No lab meeting this week (INBRE research conference)** |
| 11/11-11/15 | CH 9 cont. | CH 9 cont. | CH 9 cont. | Epoxidation of Carvone |
| 11/18-11/22 | CH 9 cont.<br>**Quiz 4, 11/18** | CH 10/11, Alkenes and Alkynes | CH 10/11 cont. | Dehydration of 3,3-dimethylbutan-2-ol |
| 11/25-11/29 | CH 10/11 cont.<br>**Quiz 5, 11/25** | **Thanksgiving**<br>**No classes** | **Thanksgiving**<br>**No classes** | **No lab meeting this week** |
| 12/2-12/6 | CH 10/11 cont. | **Exam 4 (CH 9 – 11) 12/4** | **Study Day**<br>**12/6** | **No lab meetings this week** |
| **12/11** | | **Final Exam 8:00-10:00 AM** | | |

**Note that this schedule is tentative; exam and quiz dates are likely to change**
**Unless otherwise noted in the schedule the lab notebook and safetly glasses are required.**

**Drop Deadlines:** **11/8** **Last day to drop with a "W"**

**University Academic Policies**

Familiarize yourself with all policies included in the 2018–2019 Student Handbook, particularly the following (http://uca.edu/student/student-handbook):

- Sexual Harassment Policy
- Academic Policies

## 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 (450-3135). For more information please refer to the 2016–2017 student handbook (http://uca.edu/student/student-handbook).

## Academic Integrity:

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. For more information please refer to the 2016–2017 student handbook (http://uca.edu/student/student-handbook).

## Title IX Disclosure:

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.* For more information please refer to the 2016–2017 student handbook (http://uca.edu/student/student-handbook).

## Building Emergency Plan Statement:

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.

## Student Evaluations:

Student evaluations of a course and its professor are a crucial element in helping faculty achieve excellence in the classroom and the institution in demonstrating that students are gaining knowledge. Students may evaluate courses they are taking starting on the Monday on the 13th week of instruction through the end of finals week by logging into myUCA and clicking on the Course Evaluations task.