

**CHEM 205 TUV (ORGANIC CHEMISTRY I)**  
**STUDIO CLASSROOM 3170**  
**T & TH 6 – 9:30 PM**

**INSTRUCTOR:** Michelle Kim, PhD. Email: [mkim68@ccc.edu](mailto:mkim68@ccc.edu)

**OFFICE HOURS:** 5:30 – 6 pm and after class on Tuesdays and Thursdays; or by appointment

**REQUIRED:** 1) Organic Chemistry 7<sup>th</sup> Ed. by Brown, Foote, Iverson, Anslyn. Older editions are okay. 2) Laboratory Notebook with duplicate numbered pages

**OPTIONAL:** Molecular modeling kit (strongly recommended), ChemSketch software (free from [www.acdlabs.com](http://www.acdlabs.com))

**COURSE DESCRIPTION:** Fundamentals of organic chemistry, orbitals, and structural theory, aliphatic and aromatic hydrocarbons, alkyl halides, structural isomerism, introduction to functional groups, nomenclature, stereochemistry, reaction mechanisms, resonance theory, and spectroscopy. 6 credit hours, 8 contact hours.

**PREREQUISITE:** A grade of C or better in CHEM 201 and CHEM 203 or consent from the department chair (Professor Joy Walker). If you do not have the prerequisites, you need to see me.

**STUDENT LEARNING EXPECTATIONS FOR CHEM 205:** Upon successful completion of the course the student should be able to:

1. Solve problems in organic chemistry using chemical concepts such as structural analysis, mechanistic theory, spectroscopic analysis, and elements of synthesis.
2. Safely handle and manipulate chemicals and standard laboratory equipment for synthesis, and purification, and analysis of organic compounds.
3. Record, graph, chart, analyze, and interpret data obtained from experimentation.
4. Integrate their knowledge of organic chemistry and the role that the subject plays within the broad context of the chemical sciences and society itself.
5. Effectively communicate an understanding of key chemical concepts, such as those given above, in oral and written form.

**ACKNOWLEDGEMENT OF ACTIVE PURSUIT:** In order for students to remain in this course, they must actively pursue the objectives for this course. A student will be deemed not actively pursuing this course if they have missed more than 30% of the graded material through the midterm (for example, missing more than 4 out of 14 homework and labs combined, or missing the first exam). Students not actively pursuing the course objectives will be marked as administratively withdrawn (ADW), and may lose financial aid or other negative consequences. It is the responsibility of the student to contact the professor regarding missed work. **There will be no make-up exams, homework, or lab assignments.**

**GRADESFIRST:** GradesFirst will be used to take attendance in this class. If you are absent, the GradesFirst system will generate an email to you and will also keep track of that. Your advisor should be listed in GradesFirst. If there is not an advisor listed, I recommend that you reach out to the Advising Office and ask that one be assigned. Advisors can be very helpful as you navigate your academic path at CCC. Login to GradesFirst at [ccc.gradesfirst.com](http://ccc.gradesfirst.com) using your CCC username and password. This is the same username and password you would use for Blackboard and email.

**FERPA:** FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of the student educational records: [www.ed.gov/policy/gen/guid/fpco/ferpa/index.html](http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html). Faculty cannot reveal information about students, or discuss student records over the phone or unsecure email. CCC student email meets FERPA requirements.

**ACADEMIC SUPPORT:** Students are hereby made aware of services available outside the classroom for academic and other assistance:

**Tutoring Center.** Free help for all students! (773)-907-4785, McKeon 177

**TRIO Student Support Services.** For low-income students, first generation college students, or students with disabilities who need academic support: (773)-907-4797, Room 1435. Registration is required at the start of each semester.

**Disability Access Center.** The Center verifies the needs pursuant of the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. (773)-907-4725. Room 1435. Registration is required at the start of each semester.

**The Wellness Center.** The Center provides support services for students including counseling, support groups, stress and time management coaching, referrals to community resources, and special support for victims of relationship violence and sexual assault. They can be reached at (773)-907-4786. Room 1946.

**ACADEMIC INTEGRITY:** "Academic dishonesty is a serious offense, which includes but is not limited to the following: cheating, complicity, fabrication and falsification, forgery, and plagiarism. Cheating involves copying another student's paper, exam, quiz or use of technology devices to exchange information during class time and/or testing. It also involves the unauthorized use of notes, calculators, and other devices or study aids. In addition, it also includes the unauthorized collaboration on academic work of any sort. Complicity, on the other hand, involves the attempt to assist another student to commit an act of academic dishonesty. Fabrication and falsification, respectively, involve the invention or alteration of any information (data, results, sources, identity, and so forth) in academic work. Another example of academic dishonesty is forgery, which involves the duplication of a signature in order to represent it as authentic. Lastly, plagiarism involves the failure to acknowledge sources (of ideas, facts, charges, illustrations and so forth) properly in academic work, thus falsely representing another's ideas as one's own" -p.40, CCC Student Policy Manual ([www.ccc.edu/departments/Documents/studentpolicymanual.pdf](http://www.ccc.edu/departments/Documents/studentpolicymanual.pdf) accessed 1/10/12)

In this course, violation of the academic integrity policy will result in a grade of "F" in the course, which cannot be deleted from the transcript.

**LABORATORY WORK:** The lab component consists of approximately eleven experiments plus one take home lab (structure elucidation by spectroscopy). All labs will be posted on the Blackboard website. You need to print it, read it, and be familiar with the laboratory procedure(s) you will be using. Always bring a copy to lab. Lab will be scored based on participation, the prelab write up, and lab report.

**PRELAB:** Prior to the scheduled lab period, students are required to have 1) carefully read the experimental write-up; and 2) complete the prelab prior to the beginning of the lab period. Prelab assignments are to be handed in at the beginning of the lab period. All experimental data are to be recorded in INK directly into your notebook. Do not write on pieces of scrap paper or paper towel, as they tend to get lost. If an error is made while writing in your notebook, do not use white out, instead cross it out and write the correct answer next to it.

In your notebook the following should be included (5 pts):

1. Title of the experiment
2. Purpose: State the purpose of the lab in 1-2 sentences, in your own words.
3. Structures/Reactions: Show the primary chemical reactions involved and/or structure of the compound(s) central to the experiment.
4. Materials: List the chemicals that are used and their necessary information for the experiment (e.g. molecular weight, concentration, moles needed, density, mL). You can use bullet points or make a table.
5. Experimental methods: Write a short description of the experiment using your own words. Write in enough detail that if you forgot a copy of your lab, you would still be able to complete the lab. Can be written as a list or as bullet points.

**LAB REPORTS:** Use word processing for all text; however, calculations and chemical equations may be handwritten. The report should be on an 8.5 x 11 paper with no fringe edges and should have the appearance of a professional report. Reports should be submitted one week after performing the experiment. There will be two points deducted for every class day late. No lab report will be accepted if it is more than two weeks late. Each lab report is worth 10 points. There are **no make-up labs** and all labs must be performed during the scheduled lab session.

Your report should include the following:

1. Name of the Experiment:  
Your name:  
Date performed:  
Date submitted:
2. Abstract: A brief summary (not more than 5 sentences) of the experiment, which includes what you did, the method used, and a brief statement regarding your results or lack of. (1 pt)
3. Methods: A brief narrative of the experimental procedure in your own words. Known procedures need not be written. (1 pt)
4. Results: A brief narrative of the experimental results. This section should also include your tabulated data and results, calculations, graphs, and spectra. (3 pt)
5. Discussion: Discuss the relationship between your experimental results and the expected results. Give plausible reasons (not limited to experimental errors) for any differences. Include the relevance of the results and your experience doing this experiment in relation to the stated objectives. (3 pt)
6. Conclusion: A brief summary of your conclusions (not more than 5 sentences). (2 pt)

**WRITING ASSIGNMENTS:** Organic Chemistry in the News/Movies Writing Assignment. Topic/article selection is due by March 13<sup>th</sup> and the final assignment due May 1<sup>st</sup>.

**HOMEWORK:** Homework assignment will be given at the end of each lecture on Tuesdays. Homework should be submitted after one week for full credit. There will be five points deducted for every class day late. One homework assignment will be dropped. **Note:** One problem from every homework assignment will be on the midterm or final exam.

**EXAMS:** Two midterm exams and one final exam (total of 3 exams). **No make-up exams will be given.** The approximate exam dates are given in the schedule.

**EVALUATION:** Your grade will be based on your performance in the following:

11 Homework Assignments (Drop one HW) (30 pts each)	300 pts (20%)
1 Writing assignment	100 pts (10%)
11 labs + 1 take home spectroscopy lab (15 pts each)	180 pts (20%)
2 Midterms (100 pts each – NO EXAMS DROPPED)	200 pts (20%)
1 Final Exam (220 pts)	220 pts (30%)
	1000 pts total

The following scale will be used to assign letter grades:

A > 90%; B = 80 – 89%; C = 70 - 79%; D = 60 – 69%; F < 50%

#### **COURSE OUTLINE:**

(A): List of Lecture Topics:

- Chapter 1: Covalent bonding and shapes of molecules
- Chapter 2: Alkanes and cycloalkanes
- Chapter 3: Stereochemistry and chirality
- Chapter 4: Acids and bases
- Chapter 5: Alkenes: Bonding, nomenclature, and properties
- Chapter 6: Reactions of alkenes
- Chapter 7: Alkynes
- Chapter 8: Haloalkanes, halogenation, and radical reactions
- Chapter 9: Nucleophilic substitution and  $\beta$ -elimination
- Chapter 10: Alcohols
- Chapter 11: Ethers, epoxides, and sulfides
- Chapter 12: IR Spectroscopy
- Chapter 13: NMR Spectroscopy
- Chapter 14: Mass Spectroscopy
- Chapter 21: Benzene and the concept of aromaticity

(B): List of Labs/Experiments/Assignments:

- Lab 1: Check-in, lab safety quiz, basic lab techniques
- Lab 2: Physical properties of organic compounds (m.p., b.p., solubility)
- Lab 3: Structures in organic compounds: use of molecular models I
- Lab 4: Stereochemistry: use of molecular models II
- Lab 5: Distillation (semi-micro/fractional)
- Lab 6: Extraction of caffeine from tea
- Lab 7: Sublimation of caffeine
- Lab 8: Recrystallization of a solid
- Lab 9: Synthesis of an alkene (Dehydration of a tertiary alcohol)
- Lab 10: Thin layer chromatography
- Lab 11: Identification of unknowns by IR,  $^1\text{H}$  &  $^{13}\text{C}$  NMR, MS
- Lab 12: Identification of unknowns by IR,  $^1\text{H}$  &  $^{13}\text{C}$  NMR, MS (take home)

**CALENDAR/TENTATIVE SCHEDULE (SPRING 2014)**

Below is a tentative schedule of lecture topics, homework, and exams.

\*The schedule/list of topics and lab experiments are subject to change\*

		<b>Day/Date</b>	<b>Chapter lecture Topic</b>
<b>1.</b>	<b>Week 1</b>	<b>Tues/Jan 14</b>	Chapter 1: Introduction and Review of Chemical bonding
<b>2.</b>		<b>Thur/Jan 16</b>	Chapter 1 continued
<b>3.</b>	<b>Week 2</b>	<b>Tues/Jan 21</b>	Chapter 2: Alkanes and cycloalkanes
<b>4.</b>		<b>Thur/Jan 23</b>	Lab 1: Lab check-in, lab safety quiz, basic lab techniques
<b>5.</b>	<b>Week 3</b>	<b>Tues/Jan 28</b>	Chapter 3: Stereochemistry and chirality
<b>6.</b>		<b>Thur/Jan 30</b>	Lab 2: Stereochemistry: use of molecular models I Homework 1 due
<b>7.</b>	<b>Week 4</b>	<b>Tues/Feb 4</b>	Chapter 4: Acids and bases
<b>8.</b>		<b>Thur/Feb 6</b>	Lab 3: Physical properties of organic compounds (m.p., b.p., solubility) Homework 2 due
<b>9.</b>	<b>Week 5</b>	<b>Tues/Feb 11</b>	Chapter 5: Alkenes: Bonding, nomenclature, and properties
<b>10.</b>		<b>Thur/Feb 13</b>	Lab 4: Distillation (semi-micro/fractional) Homework 3 due
<b>11.</b>	<b>Week 6</b>	<b>Tues/Feb 18</b>	Chapter 6: Reactions of alkenes
<b>12.</b>		<b>Thur/Feb 20</b>	Midterm 1 (1 hr 30 min – Chapters 1-5) Lab 5: Crystallization of a solid Homework 4 due
<b>13.</b>	<b>Week 7</b>	<b>Tues/Feb 25</b>	Chapter 6: Reactions of alkenes (continued)
<b>14.</b>		<b>Thur/Feb 27</b>	Lab 6: Isolating a neutral compound Homework 5 due
<b>15.</b>	<b>Week 8</b>	<b>Tues/Mar 4</b>	Chapter 7: Alkynes
<b>16.</b>		<b>Thur/Mar 6</b>	Lab 7: Extraction of caffeine from tea and sublimation Homework 6 due
<b>17.</b>	<b>Week 9</b>	<b>Tues/Mar 11</b>	Chapter 8: Haloalkanes, halogenation, and radical reactions

18.		<b>Thur/Mar 13</b>	Lab 8: Reactivates of Alkyl Halides Sodium Iodide in Acetone Writing Assignment topic due Homework 7 due
19.	<b>Week 10</b>	<b>Tues/Mar 18</b>	Chapter 9: Nucleophilic substitution and $\beta$ -elimination
20.		<b>Thur/Mar 20</b>	Lab 9: Synthesis of acetylsalicylic Acid Homework 8 due
21.	<b>Week 11</b>	<b>Tues/Mar 25</b>	Chapter 10: Alcohols
22.		<b>Thur/Mar 27</b>	Lab 10: Synthesis of an alkene (Dehydration of a tertiary alcohol) Homework 9 due
23.	<b>Week 12</b>	<b>Tues/Apr 1</b>	Chapter 11: Ethers, epoxides, and sulfides
24.		<b>Thur/Apr 3</b>	Lab 11: Thin layer chromatography/Column Chromatography Homework 10 due
25.	<b>Week 13</b>	<b>Tues/Apr 8</b>	Chapter 12: IR Spectroscopy
26.		<b>Thur/Apr 10</b>	Midterm 2 (1 hr 30 min – Chapters 6-11) In class writing
27.	<b>Week 14</b>	<b>Tues/Apr 15</b>	<b><i>Spring Break – no class</i></b>
28.		<b>Thur/Apr 17</b>	<b><i>Spring Break – no lab</i></b>
29.	<b>Week 15</b>	<b>Tues/Apr 22</b>	Chapter 13: NMR Spectroscopy
30.		<b>Thur/Apr 24</b>	Lab 12: Identification of unknowns by IR, NMR, BP
31.	<b>Week 16</b>	<b>Tues/Apr 29</b>	Chapter 14: Mass Spectroscopy Homework 11 due
32.		<b>Thur/May 1</b>	Chapter 21: Benzene Lab clean up / lab check out Writing Assignments Due
33.	<b>Week 17</b>	<b>Tues/May 6</b>	Review for Final Exam
34.		<b>Thur/May 8</b>	Final Exam Comprehensive