

2015

# Chemistry 201 Organic Chemistry I Laboratory Spring 2015

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## SPRING 2015 – CHE 204 ORGANIC CHEMISTRY I LABORATORY

- INSTRUCTOR:** Justin E. Culbertson
- CONTACT INFORMATION:** Office: L 262  
Phone: (406) 836-7981  
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Email: jeculbe2@illinois.edu
- OFFICE HOURS:** In L262: M 7:00 – 8:00 PM  
I'm also available by appointment.
- LECTURE:** Section 002: M 6:00 – 6:50 PM in L216
- LABORATORY:** Section 002: W 6:00 – 9:00 PM in M228
- REQUIRED MATERIALS:** Experiments for Organic Chemistry I, Illinois State University lab manual  
Labs, Lab Reports, & Course Handouts, Parkland College lab manual  
Duplicate page laboratory notebook and an ink pen  
Lab safety goggles (glasses are NOT acceptable)  
iClicker
- OPTIONAL MATERIALS:** Organic Chem Lab Survival Manual, J. W. Zubrick, 9<sup>th</sup> edition

**COURSE SCHEDULE:**

The course schedule is available in Cobra Learning, where it will be updated as needed.

**COURSE DESCRIPTION:**

Chemistry 204, Organic Chemistry I Laboratory, is a beginning organic chemistry laboratory course that teaches basic laboratory techniques (recrystallization, melting point, TLC, column chromatography, GC, refluxing, distillation, spectroscopy, etc.) and provides experience in performing simple organic reactions.

**PREREQUISITES:**

Parkland College CHE 101 and CHE 102 or equivalent with a grade of **C** or higher and concurrent enrollment in CHE 203.

**GOALS:**

- **Foundation** – Know basic terms. Understand writing skills and experimental techniques required in an advanced organic chemistry lab.
- **Apply** – Apply writing and experimental skills. Analyze and discuss experimental results. Manage small and large laboratory projects effectively.
- **Integrate** – Connect information within this course, with the organic lecture courses, and with your life experiences.
- **YOUR Growth** – Feel increasingly comfortable in a chemistry lab, working with a team of others. Increase interest in scientific experiments and/or applications. Reflect on and understand how you learn best in a chemistry lab course.

**ATTENDANCE:**

Attendance at both the lecture and the lab sessions will be graded. Lecture attendance will be based on your participation in clicker questions throughout the lecture period. These questions will be graded on a completion basis only. If you participate in all clicker questions during a lecture period, you will receive your full lecture attendance score.

In order to successfully complete this class you **MUST** attend all labs. In order for an absence to count as excused, you must provide a documented excuse for your absence (religious holiday, medical appointment,

approved college athletic activity or death in the immediate family). If you are sick enough to miss lab then you are sick enough to go and see a doctor! If at all possible, inform your instructor of any anticipated absences PRIOR to the absence.

Anyone who does not follow the lab rules provided, including additional rules as stated by your instructor, may be asked to leave the laboratory. *If you are asked to leave lab, the lab will be counted as an unexcused absence.* In addition, lab penalties may be taken out of your lab attendance grade. A list of penalties can be found on the Organic Chemistry Lab Rules handout. Additional penalties may be determined on a lab by lab basis. All penalties will be clearly stated before being applied.

Unlike other classes, most organic chemistry labs take three (3) hours to complete. Therefore, you should never expect to leave lab early. Also, anyone arriving late to lab will experience difficulty finishing his or her lab during the allotted time slot. It is very important that you come to lab on time and ready to work. Lab begins precisely at the time listed on the clock in the laboratory. At the beginning of lab demonstrations and safety instructions are made. Arriving even one minute late means that you missed part of this and your lab participation grade will be negatively affected. *If you arrive after the safety announcements you may not start the lab and it is considered an unexcused absence.*

*There will be NO make-up labs.* You will receive a 0 for all assignments associated with any missed lab (lab attendance, pre-lab quiz, notebook – both prelab & lab record, and lab report). **Two unexcused absences from lab will result in an automatic F for the course.**

#### LAB NOTEBOOKS:

How to keep a laboratory notebook properly is one of the most important skills to be learned in an organic chemistry lab. During this semester an emphasis will be placed on how well you keep a lab notebook. Both the structure and the content of the notebook will be evaluated. An excellent reference for how to keep a lab notebook is The Organic Chem Lab Survival Manual, by J. W. Zubrick. The most important aspects of a lab notebook are legibility and completeness. When a lab notebook has been written correctly, it should be possible for anyone to repeat experiments using ONLY the lab notebook for guidance. The lab notebook consists of three parts: prelab information, lab record, and post lab discussion/conclusion. Details can be found in the Course Handouts book.

#### PRELABS:

It is extremely important to be organized in order to maximize your learning (and minimize the time spent) in this class. In order to facilitate this, a prelab will be required each week at the beginning of the laboratory period. You will not be allowed to perform the lab or take the prelab quiz until after the prelab has been checked and initialed by your instructor. Unless otherwise specified, you will be asked to perform the lab using only your lab notebook. Therefore, it will be vitally important to write an organized, complete prelab.

#### PRE LAB QUIZZES:

There will be a quiz given during the first five minutes of each lab period. You may use your lab notebook (and *only* your lab notebook) on the prelab quiz. There will be NO make-up for any missed quizzes (including those missed due to tardiness).

#### LAB RECORD:

The lab record will be checked and initialed by your instructor at the end of each lab period.

#### LAB REPORTS:

Each lab report will consist of the Results, Discussion, & Conclusion sections in your lab notebook. Guidelines for what you should include can be found at the end of each lab in the Course Handouts book. The report will be due on the Monday after the lab was finished, unless otherwise indicated by your instructor. **No late lab reports will be accepted!**

#### PROJECT:

There will be one project required during the semester. The project will consist of multiple parts and will include both research and writing components. The projects may include both individual and group assignments. Further information on the specific details of the project will be provided in Cobra Learning.

#### EXAMS:

Two (2) written exams will be given to assess your understanding of the theories and principles behind the application of organic chemistry in the laboratory. These exams will focus on both the content of the labs and the skills learned during the labs. These exams will be hour exams and the first will be given during the lecture time slot as shown on the course schedule. The second will be given during final exam time slot, as shown on the course schedule.

**LAB PRACTICAL:**

There will be a lab practical given during the lab time slot as shown on the course schedule. Details on what the practical will consist of will be provided. **Failure to take the lab practical will result in an F for the course.**

**GRADING:**

Category	Points	Letter grade	Range
Introduction Assignments	4		
Quizzes (prelab) – Best 12 (5 points each)	60	A	900 - 1000
Attendance (lecture) – Best 11 (3 points each)	33		
Attendance (laboratory) – Best 13 (5 points each)	65	B	800 - 899
Pre-Lab – Best 12 (4 points each)	48		
Lab Record – Best 12 (5 points each)	60	C	700 - 799
Reports – Best 10 (33 points each)	330		
Project	100	D	600 - 699
Exams	200		
Lab Practical	100		
Total	1000		

**HELPFUL HINTS:**

While organic chemistry has the reputation of being a difficult course, I fully expect that everyone should successfully complete this course. If you are experiencing difficulty with the material, please get help as soon as possible. Help can be found during my office hours, by emailing questions to me, by visiting the Center for Academic Success, and by talking to your classmates. The Writing Center is available if help is needed for the writing portions of this class. Please do not be shy about getting help as soon as you realize you need it.

I can help make learning easier, but I can't learn the material for you. You need to make sure you come to class, read the manual(s), do the assignments, ask questions, and keep up with deadlines.

If you believe you have a disability for which you may need an academic accommodation (e.g. an alternate testing environment, use of assistive technology or other classroom assistance), please contact: Cathy Robinson, Room X148, [217-353-2082](tel:217-353-2082), [crobinson@parkland.edu](mailto:crobinson@parkland.edu)

**ACADEMIC HONESTY:**

You are expected to complete all your quizzes/exams alone without receiving or giving outside assistance - **Your brain does your quiz/exam.** Academic dishonesty (cheating) is grounds for failure of this course and academic discipline. Unethical conduct during examinations or in preparation of assignments is unacceptable and may result in disciplinary action. If you use outside resources on any written assignment, you need to remember to cite all work that is not your own in order to avoid plagiarism.

**PARKLAND POLICIES & SERVICES:**

See the syllabus addendum for more complete information on Parkland Policies & Services.

## TENTATIVE SCHEDULE – SPRING 2015

Week	Lecture (Monday)	Lab (Wednesday)	Lecture Readings
1	Introduction / Melting Points	Safety Lab Notebook / Lab Policies	Hansen 1-2; Sonnichsen: 2-18, 23 Zubrick 1-37, 87-93
2	<b>Martin Luther King Day No Class</b>	Check-In / Melting Points & Recrystallization (Parts A & B)	Hansen: 1-2; 7-12, 19-24; Sonnichsen: 22-25 Zubrick: 38-49, 104-119
3	<b>Recrystallization</b>	Melting Points & Recrystallization (Part C)	
4	Extraction / Rotary Evaporation	Separation by Extraction	Hansen: 19-28 Sonnichsen: 26-27 Zubrick: 80-83, 127-140, 195- 199, 342-344
5	Chromatography (TLC & Column)	Thin Layer Chromatography	Sonnichsen: 28-40 Zubrick: 218-241
6	Chromatography (Column)	Column Chromatography	Hansen: 41-45 Sonnichsen: 36-40 Zubrick: 234-241
7	Extraction Review / Sublimation / Gas Chromatography	Isolation of Caffeine from Tea	Hansen: 19-24 Sonnichsen: 41-46 Zubrick: 211-213, 348-357
8	<b>Exam I</b>	Isolation of Caffeine from Tea (continued)	
9	Distillation	Distillation & Gas Chromatography	Hansen: 33-48 Sonnichsen: 47-48 Zubrick: 146-151, 154-170, 178- 183, 324-339
10	IR Spectroscopy	IR Spectroscopy	Hansen: 79-81 Sonnichsen: 19, 51-53 Zubrick: 268-283, 294-300
<b>Spring Break – March 22 – Marh 28 – No Class</b>			
11	Bromine Addition / Reflux	Bromine Addition to <i>trans</i> - Cinnamic Acid	Hansen: 167-170 Sonnichsen: 54-55 Zubrick: 200-202
12	S <sub>N</sub> 1 Substitution	S <sub>N</sub> 1 Substitution	Hansen: 141-147 Sonnichsen: 57
13	Elimination / Heterogenous (Steam) Distillation	Dehydration of Cyclohexanol	Hansen: 109-112 Sonnichsen: 56 Zubrick: 183-187, 339-341
14	Chlorination	Chlorination of Heptane	Hansen: 99-104 Sonnichsen: 58
15	Project	Project Day	
16	Technique Review	<b>Lab Practical</b>	
<b>Exam II</b> Section 002 (PM) Monday, May 11 6:00 – 8:00 PM			