

**Honors Organic Chemistry II**  
**Spring 2020**  
**University of Mary Washington**  
**Section 1**

**Professor:** Davis Oldham  
**Office:** 438 Jepson  
**Contact:** eoldham@umw.edu, (540) 654-1412  
**Lecture:** MWF 2:00 – 2:50 pm, Jepson 100  
**Lab:** 9:30 pm – 12:15 pm Thursday

**Office Hrs:** 10:00 – 11:30 MF, 1 -2 MF

### **Textbooks and Supplies**

#### Required:

- Klein, D.K; Organic Chemistry. 3<sup>rd</sup> edition. John Wiley and Sons Inc, New York. 2015
- Access to WileyPlus
- Mohrig, J.R.; Hammond, C.N.; Schatz, P.F. Techniques in Organic Chemistry 4th Edition. W.H. Freeman Company, New York. 2010
- Laboratory notebook, goggles, lab coat, sharpie marker (see lab syllabus for details)
- \$20 for printing on your Eagle One card, or access to a printer

#### Recommended:

- Model kit
- Klein, D.; Organic Chemistry I as a Second Language: Translating the Basic Concepts. Wiley, New York. 2007

**Prerequisite:** A C or better in CHEM 211.

**Continuation to CHEM 317:** A grade of C or better is required to take CHEM 317 (Biochemistry I).

**Course website:** I will make use Canvas to communicate with you regularly. Make sure that you know how to use Canvas and set up the needed alerts. Please keep your UMW mailboxes empty enough that you can receive any e-mails and keep this line of communication open. You are responsible for all communication from me in this class, whether it is in lecture, lab, or e-mail.

**Course Description:** CHEM 212 is more of a synthesis class than CHEM 211, which focused on the key principles of studying reaction mechanisms and basic lab skills. You will be assessed both on your ability to construct synthetic schemes and your understanding of *how* and *why* certain reactions take place. The reactions discussed in this semester will primarily focus on the reactions of the major functional groups of organic chemistry: alkenes, alkynes, alcohols, ethers, amines, and the carbonyl groups. Time permitting, carbohydrates and polymers will also be discussed.

### **Course Objectives**

After completing the course, a student should

- Know the molecular structure, including the stereochemistry, and nomenclature of several classes of organic compounds

- Understand how these functional groups can be interconverted through synthetic sequences
- Have developed laboratory techniques for the preparation and analysis of organic compounds, including spectroscopic methods (NMR and IR)

### **Classroom Policies:**

Attendance: Attendance will not be taken during this class, and is not a component of your grade. However, lectures are more than simply a recitation of the textbook. The lectures will demonstrate how to solvent problems, and active in-class activities.

Tardiness is a distraction to your classmates and I discuss “class business” during the first 5 minutes of the class, therefore it is important that you arrive on time. If you are late, enter and get organized quietly. If you need to leave the room during class, please go and return quietly. Attendance policies in Lab are outlined in the laboratory syllabus

Electronic devices: Cell phones or other electronic devices are not to be used in class or in lab. They must be turned off during class sessions. Laptops and tablets are only permitted in class for note-taking purposes. These devices won't be needed in lab; furthermore, the lab is not a safe place for them. Please make sure they are stored away from your work area so they are not damaged by reagents or solvents. It is a policy of the chemistry department that headphones are not to be worn in the laboratory at any time.

**Academic Dishonesty:** The honor system, as outlined on the UMW Fredericksburg Honor Council Website will be strictly enforced in this course. Students are reminded of their obligation to abide by the code, including reporting observed violations to the Honor Council. The honor pledge will be written on all graded work. Books, notes, cell phones, PDAs and other electronic devices are not allowed during exams. A calculator may be used, but it must not contain any chemical information that could be used during an exam. All written work is to be prepared “in your own words”. Guidelines for source use must be followed.

<http://www.umw.edu/honor/fredericksburg/default.php>

**ADA:** The Office of Disability Resources has been designated by the college as the primary office to guide, counsel, and assist students with disabilities. If you receive services through the Office of Disability Resources and require accommodations for this class, make an appointment with me as soon as possible to discuss your approved accommodation needs. Bring your accommodation letter, along with a copy of our class syllabus with you to the appointment. I will hold any information you share with me in strictest confidence unless you give me permission to do otherwise.

If you have not made contact with the Office of Disability Resources and have reasonable accommodation needs, (note taking assistance, extended time for tests, etc.), I will be happy to refer you. The office will require appropriate documentation of disability.

### **Title IX**

University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence*. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. **While you may talk to me, understand that as a “Responsible Employee” of the University, I MUST report to UMW’s Title IX Coordinator what you**

**share.** If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit <http://diversity.umw.edu/title-ix/> to view UMW's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence* and to find further information on support and resources.

### **Policy on Recording of Class**

In this class, students may not make audio or video recordings of any course activity unless the student has an approved accommodation from the Office of Disability Resources permitting the recording class meetings. In such cases, the accommodation letter must be presented to the instructor in advance of any recording being done and all students in the course will be notified whenever recording will be taking place. Students who are permitted to record classes are not permitted to redistribute audio or video recordings of statements or comments from the course to individuals who are not students in the course without the express permission of the faculty member and of any students who are recorded. Distribution without permission is a violation of educational privacy law. This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.

### **Grades and Assignments:**

This class is a flipped classroom, meaning that the initial exposure to the material will take place outside of class; class time will be used for group work (i.e. "homework") and mini-lectures or other methods of clarifying material.

#### *Grade Weighting*

Team activities	100 points
Individual assignments	50 points
Exams ( 4 exams @ 100 points each)	400 points
Laboratory assignments	250 points
Final exam	200 points

#### *Team activities*

Periodically you will work on assignments as a group. There will also be about 7 take-home quizzes over the course of the semester. Together these assignments will comprise 15% of your grade. Each team will submit one copy to be graded.

#### *Individual assignments*

These assignments will take place at the beginning of the class and are designed to either reflect students' preparedness for class or to recap the previous class' material.

#### *Exams*

There are 4 in-class 50-minute exams throughout the course of the semester. Each will cover the material covered in the classes prior to the exam. Exams will not be rescheduled without notification prior to the week of the exam.

#### *Laboratory Assignments*

No late lab reports will be accepted. Missing more than two labs will result in an automatic F for the class. If you must miss lab, please notify the instructor prior to the week of the lab. Making up labs may be done at the instructor's discretion.

*Final Exam:* The final exam for this course is the comprehensive Organic Exam from the American Chemical Society. It is a 70 question, 110 minute multiple choice exam, including spectroscopy. The final exam for this course will be held in accordance with the schedule posted by UMW Academic Services. It is University policy that missing a final exam will result in a grade of F for the course. A review sheet and further information will be provided. A study guide for the ACS exams is available at the ACS exams website for \$23.00. <http://shopping.na1.netsuite.com/examsinstitute>. A one-time electronic practice exam is available for \$10.00 at the same link.

Final exam date: Friday, May 1st at 3:30 pm

**Recommended problems:** In addition to assigned problems, I recommend practicing problems from your textbook. Complete as many as you can, choosing different types of problems from different sections. Once you have completed those problems, you are welcome to seek out additional problems in other organic textbooks in the library, or my office. Repetition is the key to success in organic chemistry, especially to move beyond simple memorization.

**Suggestions for success:**

Hopefully you have realized, after taking CHEM 211, that organic chemistry is one of the most challenging but rewarding branches of chemistry. This course, by necessity, moves quickly to cover all the material necessary for success in future classes (especially biochemistry and other biology classes). In order to not fall behind, I recommend reading through the strategies presented below. If you are not approaching this class as a part-time, if not a full-time job, you are not spending enough time with the material.

The most important piece of advice I can give to you is to devote enough time to the course. We will be covering one chapter per week in class. Most students will require at least 12 hours per week outside of class to sufficiently grasp the material and receive a grade of B. Take a very honest look at your class and work schedules and personal obligations, and make any necessary adjustments. How you spend your 12 hours is another very important factor. I find organic chemistry to be most like learning a foreign language. To become fluent, there are things you need to memorize and things you need to learn.

*Recommended strategies*

1. Read (or at least scan) the chapter before class. I put this first because this is honestly one of the most important things you can do.
2. Be attentive and participate in class. Don't be afraid to ask questions, or to offer an answer. Students who sit near the front of class, ask, and answer questions usually do much better in class than students who sit at the back and sleep. I don't take points off or even judge students who volunteer incorrect information.
3. Re-read your notes within 24 hours of lecture. Re-work all reactions and examples covered in class. Use your book to fill in any gaps. Discuss the material with your classmates.
4. Bring any questions to me during office hours. I love talking about organic chemistry. I can't give you the answers to homework, but I will work with you until the material "clicks".
5. Work the skill builders as you work on each section. Work the end of chapter problems. Work 2 or 3, then check them using the solutions manual. If you don't get it write, rework the problem so that you are actively writing down the correct answer.
6. Study both individually and in groups. Working in groups forces you to explain your thinking to others, which is one of the best methods of learning.

7. As the exam comes closer, re-work problems that gave you difficulty.
8. Come to office hours as soon as you realize that you are not understanding, falling behind or getting confused.

### Tentative course schedule, Spring 2020

Monday	Wednesday	Friday
1/13 INTRODUCTION / REVIEW	1/15 Chapter 10	1/17 Chapter 10
<b>1/20 NO CLASS Martin Luther King Jr. Day</b>	1/22 Chapter 11	1/24 Chapter 12
1/27 Chapter 12	1/29 Chapter 12	1/31 Chapter 12
<b>2/3 EXAM 1</b>	2/5 Chapter 13	2/7 Chapter 13
2/10 Chapter 19	2/12 Chapter 19	2/14 Chapter 19
2/17 Chapter 20	2/19 Chapter 20	2/21 Chapter 20
<b>2/24 EXAM 2</b>	2/26 Chapter 20	2/28 Chapter 21
<b>3/2 SPRING BREAK</b>	<b>3/4 SPRING BREAK</b>	<b>3/6 SPRING BREAK</b>
3/9 Chapter 21	3/11 Chapter 21	3/13 Chapter 21
3/16 Chapter 16	3/18 Chapter 16	3/20 Chapter 16
3/23 Chapter 16	3/25 Chapter 17	3/27 Chapter 17
<b>3/30 EXAM 3</b>	4/1 Chapter 18	4/3 Chapter 18
4/6 Chapter 18	4/8 Chapter 18	4/10 Chapter 22
4/13 Chapter 22	4/15 Chapter 22	4/17 Special topics
<b>4/20 EXAM 4</b>	4/22 Review	4/24 Research & Creativity Day

**Final exam:** Friday, May 1st at 3:30 pm

### Tentative Chem 212 Lab Schedule

\*\*\*The order of labs may change at instructor's discretion\*\*\*

Week 1	1/16	Lab check in; Writing organic chemistry lab reports	
Week 2	1/23	Grignard reaction	
Week 3	1/30	Dehydration of alkene	SciFinder Scholar exercise due
Week 4	2/6	Column chromatography	
Week 5	2/13	Carbohydrate synthesis – nitrogen protection	Lab report 1
Week 6	2/20	Carbohydrate synthesis – oxygen protection	
Week 7	2/27	Carbohydrate synthesis – nitrogen deprotection	Introduction due
	3/5	SPRING BREAK	
Week 8	3/12	Synthesis of p-nitrophenyl ester	Lab report 2
Week 9	3/19	Hydrolysis of nitrophenyl esters	
Week 10	3/26	Measurement of $K_a$ of substituted acids	Results and discussion due
Week 11	4/2	Polymer Chemistry	Lab report 3
Week 12	4/9	Polymer Chemistry	
Week 13	4/16	Polymer Chemistry	
Week 14	4/23	Lab checkout	Lab report 4