

**Organic Chemistry I, Honors  
CHEM 211 HN**

**Fall 2024  
Section 1 (CRN 80139)**

**Disclaimer:** this syllabus is subject to change if the administration makes changes to the course schedules or if classes are cancelled due to other reasons. If changes occur, I will update the syllabus and post a revised syllabus on Canvas. You will be bound by the latest syllabus update. **Revised September 6, 2024.** *The lab schedule was revised.*

**Instructor Information:**

Kelli Slunt	kslunt@umw.edu	
Chemistry Office:	Jepson 437	Office phone number: 540-654-1406
Honors Office:	Lee 316	

**Student Success Hours (Office Hours) and Open-Door Policy:**

Typically, I plan to be in my Jepson office in the morning and in my Lee office in the afternoon. My schedule will be posted on both office doors and on Canvas. Outside of formal scheduled student office hours listed below, one can drop into my offices if the door is open and I am not occupied with someone else. I encourage students to stop by as it helps me to get to know students better and provides for informal discussions that lead to academic success.

Student Office Hours will be held in-person (please make note of the office location). I can be available on [Zoom](#) (password: 513082, meeting ID 878 5745 0170) upon request.

Mondays and Thursdays (Lee 316): 2:30 p.m. – 3:30 p.m.  
Wednesdays (Jepson 437): 9:30 a.m. – 11:00 a.m.  
Fridays (Jepson 437): 10:30 a.m. – 12:00 p.m.

Student Office Hours are subject to change – when possible, changes will be announced in advance and posted on Canvas and my office doors.

Students can also make appointments with Dr. Slunt through [EAB](#) or through [Microsoft Bookings](#). Note – you may have to copy and paste the Bookings link into your browser.

**Lecture Meeting Time:** 8:00 – 8:50 a.m. MWF (Jepson 454)

**Laboratory Meeting Time:** 9:30 – 12:15 p.m. R (Jepson 213)

**Course Materials (required):**

- Organic Chemistry, 4<sup>th</sup> edition by David Klein in ebook with Wiley plus. Paper version available and recommended.
  - The ebook and Wiley plus are a one-semester subscription for \$76.25 through First Day Inclusive Access.

- The paper book is available for purchase at the book store for an additional \$50 (a savings of \$100). This ensures that you have access to the book for future reference (future courses and MCAT preparation).
- The Organic Faculty strongly recommend that you purchase the paper book.
- WileyPlus Account for Topic Preparation Assignments and Review Assignments
- Lab Techniques for Organic Chemistry, J.R. Mohrig, D. Alberg, G. Hofmeister, P.F. Schatz, C.N. Hammond, Fourth Edition – ISBN 978-1-4641-3422-7 – you should have a paper copy of this book for in the laboratory – it is hard to use an eBook on devices in lab
- Laboratory notebook (duplicating notebook) – may use one from general chemistry but will likely need at least one or two notebooks for the year of organic chemistry
- Three-ring binder (1-1.5”) for laboratory materials
- Laboratory procedures and information must be in printed form – you will not be able to access it on an electronic device during lab – will be posted on Canvas and available as a coursepack in bookstore
- UVEX Splash Resistant Safety goggles (same as used in general chemistry)
- Labcoat (cloth or Tyvex, same as used in general chemistry)
- closed toed shoes (for lab only)
- Sharpie marker
- Scientific calculator – must be nonprogrammable – recommended ones: Casio FX260 Scientific Calculator or Texas Instruments TI34 MultiView Scientific Calculator
- Non-erasable blue or black pen (for lab)
- Access to Canvas – all materials will be posted there
- Access to printer – Must print all the laboratory materials (or purchase coursepack) and put in three-ring binder (see above)

#### **Course Materials (optional):**

- Model kit
- Klein, D. *Organic Chemistry as a Second Language*
- ACS Organic Chemistry Exam Study Guide

#### **Course Description:**

Organic chemistry is designed to illustrate the principles of bonding and reactivity in carbon-based molecules.

- understand the key concepts of molecular structure and reaction mechanisms
- be able to apply those key concepts
- have developed laboratory techniques for the preparation and analysis of organic compounds, including spectroscopic methods

As an Honors-designated course, students will meet the following objectives:

- Self-directed learning

- Students will make choices to be active agents in their own ongoing education. *The flipped classroom pedagogy and mastery grading – multiple attempts approach encourage student to pace and scaffold their learning of organic chemistry.*
- Written and oral communication skills
  - Students will employ an understanding of audience, purpose and context to communicate effectively to various audiences. *The group problem solving sessions require students to develop oral communication skills. If the group submits a group answer, student's written communication needs to convey the group's response and requires clear communication.*
- Context-driven research skills
  - Students will demonstrate the ability to perform applied research in various contexts and use research conventions and technologies suitable to their research question and purpose. *In the laboratory component of the course, students will be introduced and utilize databases and journal information to contextualize the results of laboratory experiments.*
- Inter-disciplinary synthesis
  - Students will apply the benefits of a liberal arts education by demonstrating that they are able to view topics through the lens of more than one discipline. *When possible, problems or laboratory experiments will incorporate chemistry and other disciplines within STEM fields.*
- Active meta-analysis of self and others
  - Students will actively engage in self-reflection, using meta-analysis as a tool for personal growth and general problem solving and reflection. *The scaffolded and multi-attempts to master topics will require students to reflect on their problem solving. The cumulative topics require use of higher order thinking and application.*

#### **Course Prerequisite:**

The prerequisite for CHEM 211 is completion of CHEM 112 with a grade of C or higher. You must earn a grade of C or better in this course (CHEM 211) in order to proceed to CHEM 212 at UMW.

#### **Course Communication:**

Canvas will be utilized as the course management system and means of official communication for the class. Students should check Canvas regularly for updates and materials for lecture and lab. Preparation assignments for each topic will be completed using WileyPlus.

#### **Flipped Classroom:**

The flipped classroom will be utilized this semester in CHEM 211. Outside the classroom, students will watch videos on lecture topics, read the textbook material, complete a required preparation assignment, and work recommended practice problems. During the class meeting, students will have opportunities to master topics during daily topic assessment period,

complete in-class assignments, and ask questions about the topics. You will be working on the in-class assignments in small groups.

### Course Grade:

The grade in the course will be determined using a hybrid mastery grading-percentage-based system. Instead of traditional exams, lecture material will be assessed using small-stakes assessments. Laboratory and in-class assignments will be graded as percentage correct. The final exam will be the cumulative ACS First-Term Organic Exam. The raw score on the ACS multiple choice exam will be curved and reported as a percentage score. See the table under the final grade how the course grade will be assessed based on this hybrid spec grading-percentage-based system.

**Class Assignments** – the final course grade will be evaluated based on different types of assessments

- 1) Topic Preparation Assignments – these assignments will be completed using Wiley Plus and are due by 8:00 a.m. on the morning on which the topic will be discussed in-class. The questions are graded by the Wiley Plus system and are graded as correct or incorrect. Students are permitted 2 attempts per question.
- 2) Topic In-Class Assignments – these assignments will be completed in-class as a group and are due during class, by the conclusion of the class period. Questions on the assignment will be graded with the scale below in Table 1.
- 3) Topic Assessments – the class period after the conclusion of topic discussions and in-class assignment, students will complete a topic assessment in-class, closed book, closed notes. The questions on the assignment will be graded using the scale below in Table 1.
- 4) Laboratory Assessments – see the portion of the syllabus about the laboratory for more details on laboratory assignments.
- 5) Final Exam - Cumulative Final Examination (see more details below)

**Grading Rubric:** The following grading rubric and points will be used to evaluate questions on assignments in the course

*Table 1: Grading Rubric with Points for Grade Classifications*

Classification	Description	Points
M = Mastery	The answer completely and clearly demonstrates a sophisticated understanding of the concepts. Any error is minor.	10
P = Proficiency	The answer demonstrates an understanding of the concepts but needs some revision or expansion or correction of some small errors.	8
R = Revision	The answer demonstrates partial understanding or needs revision to correct explanations, significant errors, or incomplete answer.	6

NP = No Pass	The answer does not demonstrate understanding or shows misunderstanding, or an insubstantial attempt was made.	3
NS = No Score	The question was not answered.	0

**Final Course Grade:** The course grade will be determined using the grading scheme that produces the highest grade for the student.

**Option 1 – Mastery Grading for Topic Assessments** – For mastery grading of the topic assessments, students will be permitted to re-attempt a similar assessment on the topics.

Process for Mastery Grading:

- 1) Topic Assessments will be graded as passed or not passed. Mastery is demonstrated by correctly answering each question on the assessment with a score of M or P.
- 2) You will be given many opportunities to pass a topic. You will be permitted up to two re-takes of a topic in class. The re-takes will not be the same assessment but will cover the material in the topic at a similar level. Before a re-take, students are encouraged to complete practice problems and review material for the topic on Canvas. All attempts will occur in the classroom (except for the one “absence” token). No additional retakes will be permitted outside of class (unless specified in classroom accommodations).
- 3) “Absence” Token – each student will receive one attempt for an assessment outside of the classroom attempts. This will be counted towards the three permitted attempts. It is available for the case of an absence from class. Once the token is used, there will not be other opportunities to earn a token. Students will simply make-up the topic attempt during the daily classroom period.
- 4) If a student fails to pass a topic after the three permitted in-class attempts, one additional attempt can occur after completion of the ACS final exam but before the final exam time period for the class concludes. The final exam window for CHEM 211 is 150 minutes long. Any time remaining after completion of the ACS Final can be used to attempt to mastery of up to four unmastered topic assessments.

For option 1, the student grade will be determined as outlined in table 2.

*Table 2: Minimum numbers of specs assignments and minimum percentage scores on laboratory, in-class, and final exam that are required for a specific letter grade in the course using Grade Option 1.*

Letter Grade	Minimum Number of Topic Assessments Passed	Minimum Percentage Score on Preparation Assignments and In-class Exercises	Minimum Percentage Score on Laboratory Assignments	Minimum Percentage on the ACS Final Exam
A	20	93	90	85
A-	19	90	87	82
B+	18	87	85	80
B	17	83	80	75

B-	16	80	77	72
C+	15	77	75	70
C	14	73	70	65
C-	13	70	67	62
D+	12	67	65	60
D	11	60	57	52
F	Lower score in any grade area			

### Option 2 – Grade Based on Points for Assignments

The overall grade for option 2 will be based on the following:

- Topic assessments - the first attempt will be graded with the point scales in the table 1. (35% of the final grade)
- Topic preparation assignments and in-class exercises (20% of the final grade)
- Laboratory Exercises (25% of the final grade)
- Final ACS Exam (20% of the final grade)

**Mid-semester Grade:** A mid-semester report of unsatisfactory (U) will be reported if you have not mastered 80% of the topic assessments or scored an average grade of 70% topic assessments and earned at least a 70% average on in-class and laboratory assignments at mid-term.

### Cumulative Final Examination:

The final examination in this course is a cumulative standardized final examination developed by the American Chemical Society that will assess your knowledge about the organic chemistry topics covered this semester.

A study guide for the ACS organic chemistry exams is available at the ACS exams [website](#) for \$25. **A student who has not taken a required final examination has not completed the course requirements and therefore fails the course.** Please see the [academic policies section](#) of the academic catalog for the procedure for rescheduling a final exam. **In order to pass the course, students will be required to complete the ACS final exam and the laboratory practical exam.**

The ACS final exam will be graded based on the number of questions correctly answered and the final percentage grade will be based on national norms and past UMW CHEM 211 performance on this standardized exam.

Students are not permitted to write in the ACS final exam booklet. Scrap paper will be provided. Any marks in the ACS final exam booklet will result in a deduction of up to 10% on the final exam grade for failure to follow directions.

### Class Absences and Make-up Policy:

It is expected that students will attend class and complete the mastery assignments in person. As outlined in the [catalog](#), a student is responsible for their decision to miss a particular class

and it is at the discretion of the faculty to allow a student to make-up missed assignments. If you are sick, please stay home, take care of yourself, and seek medical care.

As outlined under grading, all topic assessments will be completed in-class during the first 15 minutes of class. As those assessments are available at the start of each class, students missing a class will attempt a topic assessment during the next available class period or utilize their one-time absence token.

Students could complete the in-class assignments during the class period remotely if they are unable to physically attend class, but must complete the assessment individually and submit by the end of the class period. They will miss out on the group collaborative learning. I discourage this as the in-person face to face interaction with peers supports the learning process but should be used in the case of absence due to illness or other circumstances.

Lateness to the classroom is distracting to others and will impact completion of the daily topic spec assignments. These assignments will occur in the first 15 minutes of the class. A student arriving late will likely miss the opportunity to complete the topic mastery for that day and will have to complete them during a different class period.

**Laboratory attendance is mandatory. Students who miss more than 2 laboratories will automatically receive a failing grade in the course.** Unexcused or unscheduled absences from laboratory cannot be made up and will result in zero points for the associated laboratory assignments. Scheduled absences may be made-up, if possible, at the **discretion of the instructor**. Please consult Dr. Slunt *in advance* if you expect to be absent or as soon as an emergency passes to discuss your laboratory absence.

#### **Honor System Statement:**

In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by writing at the end of the work, "I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work. (your signature)" It is your duty as students and ours as faculty to uphold the Honor Code, which is described in detail in the [Guidebook & Constitution](#). Suspected violations of the Honor Code will be addressed according to the policy established by the Honor Council.

#### **Disability Resources Statement:**

I strive to create a fully inclusive classroom; thus, I welcome individual students to approach me about your learning needs and requests for accommodations. To obtain accommodations for this course, students with disabilities should contact the Office of Disability Resources (ODR) by email at [odr@umw.edu](mailto:odr@umw.edu) or by phone at 540-654-1266. ODR is responsible for coordinating disability-related accommodations.

I also recognize that at times the class might not be accessible, despite efforts to ensure universal access. Please contact me if you find that lecture or discussion format to be not accessible to your needs. Additionally, if the facilities are inaccessible, please let me know. I am

committed to making your learning experience as accessible as possible. I want to ensure that accessibility is a process that we communicate as a class together throughout the semester.

#### **Title IX Compliance Statement:**

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 your instructor, understand that as a "Responsible Employee" of the University, they 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 [the UMW website](#) 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.

#### **Classroom Recording Statement:**

Classroom activities in this course may be recorded by students enrolled in the course for the personal, educational use of that student or for all students presently enrolled in the class only, and may not be further copied, distributed, published or otherwise used for any other purpose without the express written consent of the course instructor. All students are advised that classroom activities may be taped by students for this purpose. Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded. **Distribution without permission is a violation of copyright law.** This policy is consistent with UMW's [Policy on Recording Class and Distribution of Course Materials](#).

#### **Student Support on Campus:**

There are a number of supports on campus for students. If any of these apply to you, I encourage you to visit these centers on campus or contact the offices listed below. This list is not inclusive, if you have other needs and feel comfortable to speak with me about them, I will direct to the appropriate offices on campus.

**IT Help Desk:** If you are having difficulties with Canvas or connecting to online University resources, seek assistance from the Help Desk ([website](#), call 540-654-2255, or email [helpdesk@umw.edu](mailto:helpdesk@umw.edu)).

**Simpson Library:** The Simpson Library provides access to important physical and online resources and spaces. Computers, printers, scanners, and study rooms are available for students, faculty, and staff. Research librarians are available to assist you via phone, email, chat, or face-to-face. Online databases, research guides, and e-books are accessible off-campus by using your network ID and password. An online interlibrary loan service is also available so that students can request books and articles not available at the Simpson Library. Contacts: [website](#) or 540-654-1148)



**UMW Speaking and Writing Center:** The Speaking and Writing Center, located in the Hurly Convergence Center 429, supports oral and written communication skills development through one-on-one or group consultations that address every stage of the composing process from brainstorming to final presentation and editing. UMW students can schedule 30- or 60-minute appointments, in-person or online, by visiting our [webpage](#) and clicking on “Schedule an Appointment” or going directly to our [appointment scheduler](#).

We are committed to aiding development of written and oral skills aimed towards effectively communicating a diversity of views. The Speaking and Writing Center adheres strictly to the Honor Code; consultants will not compose any portion of a paper or presentation for a student, nor will they do research for a student.

For more information, please contact Dr. Leah Schweitzer, Director of the Speaking and Writing Center, at [lschweit@umw.edu](mailto:lschweit@umw.edu) or 540-654-1347 or visit our website at [academics.umw.edu/swc/](http://academics.umw.edu/swc/).

**Basic Needs Security:** Learning effectively and engaging wholly in class is dependent upon our basic security and having our fundamental needs met: having a safe place to sleep at night, regular access to nutritious food, and some assurance of safety. If you have difficulty affording groceries or accessing sufficient food to eat every day, or if you lack a safe and stable place to live, please contact Chris Porter, Assistant Dean of Students, [cjporter@umw.edu](mailto:cjporter@umw.edu). Additionally, the Gwen Hale Resource Center is a free resource on campus, providing food, toiletries and clothing to any member of our community. It is open Monday, Tuesday and Friday from 1pm-6pm, on the 5<sup>th</sup> floor (floor A for Attic) of Lee Hall, or [resource@umw.edu](mailto:resource@umw.edu). Finally, you are always welcome to talk with me about needs, if you are comfortable doing so. This will enable me to provide any resources I may possess.

### Lecture Course Calendar:

Please see Canvas for Links for Each Topic. The Topic pages will contain links to the lecture video to watch, pre-lecture reflection assignments, references to the sections in the Klein textbook, and suggested practice problems.

Topic discussion days will have this basic schedule:

- Topic assessment (15 minutes)
- In-class problem assignments along with review of problems and time for questions and answers (35 minutes)

<b>Mondays</b>	<b>Wednesdays</b>	<b>Fridays</b>
<u>August 26</u> Course overview	<u>August 28</u> Topic 1	<u>August 30</u> - Last day to add classes Topic 2
<u>September 2</u>	<u>September 4</u>	<u>September 6</u>

<i>Labor Day</i> – no class	Topic 3	Topic 4
<u>September 9</u> Topic 5	<u>September 11</u> Re-attempt Day or Make-up Day	<u>September 13</u> – <i>Last day to drop class without W</i> Topic 6
<u>September 16</u> Topic 7	<u>September 18</u> Topic 8 (Day 1)	<u>September 20</u> Topic 8 (Day 2)
<u>September 23</u> Topic 8 (Day 3)	<u>September 25</u> Topic 9	<u>September 27</u> Topic 10 (Day 1)
<u>September 30</u> Topic 11 (Day 1)	<u>October 2</u> Topic 11 (Day 2)	<u>October 4</u> Topic 12 (Day 1)
<u>October 7</u> Topic 10 (Day 2)	<u>October 9</u> Topic 12 (Day 2)	<u>October 11</u> Topic 12 (Day 3)
<u>October 14</u> <i>Fall Break</i> – no class	<u>October 16</u> Topic 13	<u>October 18</u> Topic 14 (Day 1)
<u>October 21</u> Topic 14 (Day 2)	<u>October 23</u> Topic 15	<u>October 25</u> Topic 16 (Day 1)
<u>October 28</u> Topic 16 (Day 2)	<u>October 30</u> Topic 16 (Day 3)	<u>November 1</u> – <i>Last day to change to/from pass/fail, last day to withdraw from classes</i> Topic 17 (Day 1)
<u>November 4</u> Topic 17 (Day 2)	<u>November 6</u> Topic 17 (Day 3)	<u>November 8</u> Topic 18 (Day 1)
<u>November 11</u> Topic 18 (Day 2)	<u>November 13</u> Topic 19 (Day 1)	<u>November 15</u> Topic 19 (Day 2)
<u>November 18</u> Topic 20	<u>November 20</u> Topic 21 (Day 1)	<u>November 24</u> Topic 21 (Day 2)
<u>November 25</u> Topic 22 (Day 1)	<u>November 27</u> – <i>No class</i> <i>Thanksgiving Break</i>	<u>November 29</u> – <i>No class</i> <i>Thanksgiving Break</i>
<u>December 2</u> Topic 22 (Day 2)	<u>December 4</u> Topic Review or Final Exam Review	<u>December 8</u> – <i>Last Day of Classes</i> Topic Review or Final Exam Review
Final Exam Week	Final Exam Week	Final Exam Week

### Lecture Topics:

Topic 1: Drawing Lewis Structures and Constitutional/Structural Isomers

Topic 2: Bonding Theories and Molecular Geometries/Bond Angles

Topic 3: Molecular Representations (Bond-line structures, 3-dimensional drawings)

Topic 4: Functional Groups/Families

Topic 5: Cumulative Topic on Drawing and Representing Organic Molecules

Topic 6: Molecular Polarity, Intermolecular Forces, and Physical Properties

Topic 7: Resonance

Topic 8: Acid and base properties and reactions

Topic 9: Cumulative Topic on Predicting reactive sites and properties of organic compounds

Topic 10: Nomenclature of Organic Compounds including Stereoisomers

Topic 11: Conformations of Alkanes, Heat of Combustion, and Conformations of Cycloalkanes  
Topic 12: Stereoisomers (Enantiomers and Diastereomers), Meso Compounds, Physical Properties of Stereoisomers  
Topic 13: Cumulative Topic on Drawing and Representing Organic Molecules Part II  
Topic 14: Thermodynamic versus Kinetic Control of Reactions  
Topic 15: Curved arrow mechanism (part II), Nucleophiles and Electrophiles  
Topic 16: Substitution Reactions  
Topic 17: Elimination Reactions  
Topic 18: Cumulative Topic on Substitution and Elimination Reactions, Mechanism and Introduction to Synthesis  
Topic 19: Addition to Alkenes and Alkynes  
Topic 20: Oxidation of Alkenes and Alkynes  
Topic 21: Preparation and Reactions of Organohalides – Radical Reactions  
Topic 22: Cumulative Topic on Cumulative Reactions, Mechanism and Synthesis

### **Laboratory Information:**

For each laboratory exercise, a page will be created in Canvas. This page will include videos, assigned readings, and lab procedure that will help you prepare for the experiments. You will need to review the material on Canvas and print hardcopies of procedures for the three-ring binder.

#### **Three-ring Binder:**

For each of the laboratory exercises, you are required to maintain hardcopies of procedures, data and the carbon copies from the duplication notebook in a three-ring binder. Some procedures and information will be needed as reference throughout the semester. A well organized three-ring binder will serve you well throughout the semester and for the laboratory practical exam.

#### *Three-ring Binder with Suggested Sections*

- 1) Laboratory Procedures and Notes
- 2) Notebook Pages and Data – you will place the perforated carbon copies from the duplication notebook and hardcopies of data like IR spectra and DSC thermograms.

#### **Lab Notebook:**

For each of the wet chemistry laboratory exercises, you are required to keep a written record of your experiments in a duplication laboratory notebook. The portion of the notebook pages completed before the laboratory begins will help guide you to complete the experiments. Follow the guidelines posted on *Canvas* as well as the information on pages 32-39 of *Techniques in Organic Chemistry* for writing notebook entries. All entries should be written in nonerasable blue or black ink, not pencil or erasable ink. Please write legibly, but you do not need to be perfect. You cannot write on a separate piece of paper and then copy the information into the notebook. Learn to write directly into the notebook. If you make an error, draw through the mistake with a single line. If the writing is unclear or scribbled out, points will be deducted from your notebook grade.

#### *Sections of Notebook Pages (In the carbon copies)*

- 1) Pre-laboratory information
- 2) During the laboratory information – procedure information, data, observations
- 3) Post-laboratory data analysis

### *Pre-laboratory Notebook Information*

The pre-lab assignments are designed to have you think about and help you prepare for completing the experiment. In advance of each wet chemistry laboratory exercises, review the sample laboratory pages and guidelines, experimental information, and background material, and create pre-laboratory notebook pages. **If you do not complete and submit copies of your pre-lab notebook pages to Canvas or hand in the carbon copies before the start of the experiment, you will not be permitted to enter the laboratory and will receive an unexcused absence and a zero for the experiment.** You will document (photograph or scan) the notebook pages and submit the images or pdf through the assignment link on Canvas or you may submit the carbon copies of the notebook pages in person at the start of the laboratory period.

Pre-laboratory notebook pages must contain the following:

- Title for experiment
- Purpose
- Chemical equation (with complete structures of the molecules) for experiments involving reactions
- Table of reagents, reactants, and products with appropriate physical properties with literature references
- Procedure reference

See the document on Canvas for more details on the pre-lab notebook pages.

### *During the Laboratory Notebook Information*

For each wet chemistry laboratory exercises, you are required to record your data and observations directly into a laboratory notebook. Write everything in your notebook. You need to record what you did and what you observed/determined – it does not need to be complete sentences. Record all observations and data (i.e. melting point, volumes, manufacturers of chemicals, mass of compounds, physical appearance, reaction times, etc.). You should follow the guidelines in the laboratory manual and posted on Canvas.

### *Post-laboratory Data Analysis and Summaries*

After leaving the laboratory period (and post-lab data collection), you will analyze the results and answer the post-lab questions in the laboratory handout. All data analysis and calculations must be completed in the laboratory notebook, on spectral data pages, or typed in a document. After reporting the results (i.e. melting point range, IR stretches, etc.), you need to include a meaningful explanation about what you discovered in the experiment and a comparison of your findings with the literature. It should not be a statement of data without a discussion of the significance of the findings and any conclusions that can be drawn from your data. Be sure to answer the post-lab questions.

Electronic copies of the final notebook pages, data analysis, and summaries must be uploaded to Canvas or submitted in hard copy by 9:30 am on the due date.

### *Laboratory Final Practical Exam*

The final laboratory exam will test your understanding of the theory, data analysis, and safety of the techniques covered in the course. You will be required to conduct an experiment as part of the exam and will be graded on the outcomes of the experiment as well as your data analysis and answers to questions about the experiment. You will be permitted to use your lab manual and three ring notebook. You will not be permitted to ask any questions unless they relate to a safety concern. Failure to complete the final practical exam will result in failing the course.

### **Late laboratory work policy:**

The pre-laboratory assignment must be submitted in Canvas or submitted in hardcopy by 9:30 am on the day of the experiment. Late pre-lab assignments will not be accepted.

Post-lab assignments are due at 9:30 am on the date announced on Canvas. These assignments will also be submitted in Canvas or submitted in hardcopy. Late post-lab assignments will be accepted with a grade deduction. For each 24-hour late submission, a 5% deduction will occur.

### **Honors Code and Organic Chemistry Laboratory:**

Alteration of data or copying data from another individual (unless permitted by the instructor or group experiment) is an honor offense as well as scientifically unethical. All laboratory assignments must be completed individually without consulting your classmates or other students. You may use your laboratory manual, textbook, and information posted on the Canvas course page to complete the assignments. All references utilized to complete the assignments must be cited using ACS style guide format.

### **Attendance:**

See the earlier section about attendance under lecture portion of the syllabus.

### **Safety:**

Safety in the chemistry laboratory is extremely important. Safe laboratory practices will be presented in the course and outlined in the laboratory materials for each experiment. You will sign a safety agreement with the school. **Violations of safety procedures will result in removal from the laboratory and a grade of zero for that day's work.** Repeated violations will result in a meeting with the Departmental Safety Office and Chair and could result in failure of the course.

### **Access to the Laboratory:**

There will be occasions on which you must return to the laboratory outside of class time to complete some simple laboratory tasks such as obtaining a melting point, weighing a sample, or characterizing the sample by spectroscopy. You **must** complete this work during the hours of 9 am and 4 pm M-F or during another organic laboratory section with permission of the instructor of that section. You may not request access to the organic lab door except for from a chemistry faculty member. Do not ask any other faculty or the building staff for this access. *As much as possible, please let me know if advance your plan for when you enter the laboratory to*

*perform the experiments (as much as possible a 24-hour advanced notice is preferable, especially if you want to use the DSC).* For certain instruments (i.e. DSC, NMR, GC-MS), you cannot use the instruments independently without previous training and approval for independent use by Dr. Slunt. When you are trained, you will receive documentation of training that you should show to another faculty member if Dr. Slunt is unavailable to provide you access to the instrument. **If there is no one in the laboratory at the time you plan to work, you must be accompanied by another student.** This student does not have to be enrolled in organic but must be responsible. This rule is in place for your safety. Your buddy can call for help if an accident occurs. When you are finished in the lab, the lab door must be closed. Failure to abide by these policies and/or conduct yourself appropriately in the lab during these out of lab access period could result in a zero for that laboratory exercise, result in a meeting with the Department Safety Officer and Chair, or failure of the course.

### **Laboratory Schedule: Thursdays 9:30 a.m. – 12:15 p.m.**

<b>Date</b>	<b>Topic</b>	<b>Assignments (must be posted to Canvas or turned-in on paper by 9:30 a.m.)</b>
August 29	Introduction and Safety, Notebooks, Melting point overview, SciFinder Exercise	No assignments – pre-lab videos and readings but no assignment to turn in
September 5	Melting Point and Differential Scanning Calorimetry (MP/DSC)	1) SciFinder assignment 2) Pre-lab notebook pages for MP/DSC
September 12	Melting Point and Differential Scanning Calorimetry (MP/DSC) and Infrared (IR) Spectroscopy	Pre-lab notebook pages for IR
September 19	Synthesis and Recrystallization	1) Lab notebook pages and post-lab for MP/DSC 2) IR post-lab assignment 3) Pre-lab notebook pages for Synthesis and Recrystallization
September 26	Extraction	1) Lab notebook pages and post-lab for Synthesis and Recrystallization 2) Pre-lab notebook pages for extraction
October 3	Thin Layer Chromatography (TLC)	1) Lab notebook pages and post-lab for Extraction 2) Pre-lab notebook pages for TLC
October 10	Column Chromatography	1) Lab notebook pages and post-lab for TLC 2) Pre-lab notebook pages for Column Chromatography
October 17	NMR Spectroscopy	1) Lab notebook pages and post-lab for Column Chromatography

		2) No pre-lab assignment for NMR Spectroscopy – there are pre-lab videos to watch
October 24	Thermodynamics and Gas Chromatography (GC)	1) NMR Assignment 2) Pre-lab notebook pages for Thermodynamics and GC
October 31	Distillation and GC	1) Lab notebook pages and post-lab for Thermodynamics and GC 2) Pre-lab notebook pages for Distillation and GC
November 7	Mass Spectrometry and Integrated Spectroscopy	1) Lab notebook pages and post-lab for Distillation and GC 2) No pre-lab for MS and integrated spectroscopy – there are pre-lab videos to watch
November 14	Substitution Reactions	1) MS and Integrated spectroscopy assignment 2) Pre-lab for Substitution Reactions
November 21	Addition reaction to an alkene	1) Lab notebook pages and post-lab for Substitution Reactions 2) Pre-lab notebook pages for Additions Reactions
November 28	No Lab Thanksgiving	
December 5	Lab exam and lab check-out	Lab notebook pages and post-lab for Addition reaction to an alkene