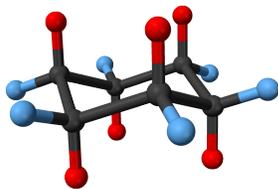
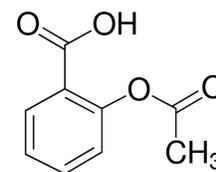


# William & Mary CHEM 206-03



Spring 2022

## Organic Chemistry I



Instructor - Dr. Dana Lashley, Office - ISC 1052, Email - [DLashley@wm.edu](mailto:DLashley@wm.edu)

**Class Meetings:** Tu/Th 9:30am – 10:50am AND Tu 6:30pm – 8:20pm in **ISC 1221**.

The latter evening time on Tuesdays will be used for Help-Sessions and midterm exams. Attendance for exams is mandatory. Attendance to help-sessions is optional but HIGHLY encouraged.

**Office Hours:** Tuesdays 11am – 11.50am, Thursdays 1.30pm – 2.20pm or by appointment.

**Contact:** You should always feel free and comfortable to contact me with any questions or concerns. Visit me in my office hours (listed above) or shoot me an email to schedule an appointment.

**Class Zoom link:** <https://cwm.zoom.us/j/99490750697?pwd=VIJhVkJKUK2Q5dEh1azZoK2FDUDZMUT09>

Meeting ID: 994 9075 0697      Passcode: enantiomer

Zoom may occasionally be used for help-sessions, lectures, or office hours.

**Inclusion and Diversity:** I value all students regardless of their background, country of origin, race, religion, ethnicity, disability status, sexual orientation or gender identity. I am committed to providing a climate of excellence and inclusiveness within all aspects of this course. If there are aspects of your culture or identity that you would like to share with me as they relate to your success in this class, I am happy to meet to discuss. Likewise, if you have any concerns in this area or facing any special issues or challenges, you are encouraged to discuss the matter with me. You can set up a meeting with me via email with an assurance of full confidentiality (only exception being mandatory reporting of academic integrity/code violations and sexual harassment/misconduct).

### Course Materials:

Required: “*Organic Chemistry as a Second Language - First Semester Topics*” 4<sup>th</sup> or 5<sup>th</sup> Edition, by Klein (ISBN: 978-1-1191-1066-8). (**Klein book**)

Price ca. \$20 - \$60 varies for e-book vs paperback

Required: [CHEM101 online homework access](#). (**CHEM101**)

Can be ordered online. Instructions are at end of syllabus.

Price is \$28 when purchased online.

\*Recommended: *Organic Chemistry, 7<sup>th</sup> or 8<sup>th</sup> Edition*, Brown, Iverson, Anslyn, & Foote (ISBN 9781285052618). (**Brown book**)

\*Recommended: *Student Study Guide and Solutions Manual for Organic Chemistry, 7<sup>th</sup> or 8<sup>th</sup> Ed.*, Iverson and Iverson (ISBN 9781133952848)

Recommended: Darling Organic Model Set (or any other organic chemistry model set). The model set may be used during tests. (ISBN 9780964883710)

\*= these items are on reserve at Swem library and can be checked out for several hours at a time.

**Required Websites:** You will interact with 3 separate sites for this course:

1. **Blackboard.** Course related materials such as lecture templates/notes, exam keys, grades and announcements will be posted on Blackboard ([www.blackboard.wm.edu](http://www.blackboard.wm.edu)).
2. **CHEM 101.** Completion of online homework through CHEM101 is required. You will need to purchase access and create an account. Detailed instructions on how to set up the account are posted on Blackboard. **Please have CHEM101 ready to go on the SECOND day of class (Tuesday Feb 1<sup>st</sup>) by class time.**
3. **Gradescope.** Your exams for this course will be graded in Gradescope. There is nothing you need to do to set it up. Once an exam is graded you will receive an email with a link to your graded exam. Regrade requests for an exam can then be submitted directly in Gradescope (must occur within 3 class dates after return of exam).

**Course Objective:** At the completion of this course, students should be able to:

- 1) Recall and recognize general chemistry topics as they apply to organic molecules
- 2) Apply molecular representations to describe the structure and nature of organic molecules
- 3) Evaluate and predict acid/base reactions in the context of organic chemistry
- 4) Analyze the various shapes (conformations) that organic molecules can adopt
- 5) Recognize the importance of the 3-dimensionality of organic molecules, how symmetry affects molecular structure and identify the various isomeric relationships between molecules
- 6) Apply thermodynamic and kinetic concepts to predict the behavior of chemical reactions
- 7) Explain why organic reactions occur and evaluate various reaction conditions to predict the results
- 8) Propose mechanistic pathways that explain the outcome of organic reactions
- 9) Understand the fundamentals of organic spectroscopy and elucidate (=solve) organic structures based on given spectra

**Course Delivery:** mostly in person. All lectures will be recorded and placed on Blackboard. Technical issues may arise – your best bet is to come to live classes!

**Help- & Review-Sessions:** EVERY TUESDAY at 6.30pm – 8.20pm **in ISC 1221.**

ADDITIONAL Help-Sessions will be offered before exams via ZOOM.

**Sunday, February 20<sup>th</sup> at 6.00pm – 8.00pm:** Help-Session for **Exam 1**

**Sunday, March 27<sup>th</sup> at 6.00pm – 8.00pm:** Help-Session for **Exam 2**

**Sunday, April 24<sup>th</sup> at 6.00pm – 8.00pm:** Help-Session for **Exam 3**

**Sunday, May 8<sup>th</sup> & Monday May 9<sup>th</sup> at 6.00pm – 8.00pm:** Help Sessions for **Final Exam**

Help-sessions, whether on Zoom or face-to-face, will be recorded and posted on Blackboard.

Help-sessions are not mandatory but HIGHLY RECOMMENDED. Homework assignments will be reviewed, additional practice problems will be discussed and course content will be clarified upon request. You will have the chance to ask many questions.

**Don't miss out on this opportunity it can make a big difference in your understanding of orgo!**

## Final grade:

Graded Coursework	Points
Exam 1*	200
Exam 2*	200
Exam 3*	200
Final	400
CHEM101 Homework (8 x 19.5 pts)	156
Attendance & daily in- class Quiz Question (22 x 2 pts)	44
<b>Total (minus lowest 200)</b>	<b>1000</b>

\* can be dropped

Your lowest 200 points, stemming from either one of the midterm exams will be dropped. This policy is also in place in case of sickness, i.e. if you miss an exam due to sickness, this will be your dropped exam. You cannot drop the final examination, the quizzes, attendance or the homework grade.

The maximum number of points you can achieve in the course are 1000. Your final grade will be determined by the sum of your points throughout the semester in the following **FIRM scale**:

A	93-100%	A-	90-92.99%
B+	87-89.99%	B	83-86.99%
B-	80-82.99%	C+	77-79.99%
C	73-76.99%	C-	70-72.99%
D+	67-69.99%	D	63-66.99%
D-	60-62.99%	F	< 60%

For example, the minimum number of points required for an A- are 90% of 1000 points = 900 points.

### General information for Attendance, Quizzes and Exams:

**Attendance & Daily in-class Quizzes:** In accordance with W&M policy, class attendance is expected. See undergraduate catalog for more information. Please notify me of any absences by email.

I will take daily attendance using the CHEM101 app. The course meets 27 times this semester for class in the morning. You will be given 1 point each time you attend for a max total of 22 points. In other words you can miss up to 5 classes without any penalty. In case of extenuating circumstances or long-term illnesses please contact me so we can find the best solution on a case-by-case basis.

No attendance will be taken during Help-Sessions in the evenings.

Each class day there will also be a live quiz consisting of one or more questions. The quiz will be delivered using the CHEM101 app and will test your understanding of class content from the previous class or from what was covered in class that same day. This is to encourage you to pay attention in class and to review class notes from the previous class. This way, you can earn 1 quiz point in addition to the 1 attendance point each class day:

Correct Answer on Quiz = 2pts

Incorrect Answer on Quiz = 1pt (this counts as your attendance)

As mentioned above under attendance, you can miss 5 class days for no penalty at all. Only 22 quiz/attendance scores will count toward your final grade for a max total of 44 pts.

### **Midterm EXAMS:**

ALL midterm exams will be taken **in-person on Tuesday evenings at 6.30pm – 8.20pm** on the days indicated on the schedule below (dates are subject to change).

There will be three (3) midterm exams, each worth 200 points. The lowest of these exams will be automatically dropped.

### **Final examination (firm date) will be a comprehensive in-person final:**

**Tuesday, May 10<sup>th</sup>, 7 pm - 10 pm.** There will be **NO EARLY FINAL EXAM**... plan your schedule (for example travel, jobs, vacation) now to accommodate the day and time for the final exam.

**Grading concerns/re-grades:** All grading concerns need to be discussed with me within 3 class days upon receiving your graded exam. After that there will be no re-grades.

You may submit regrade requests directly through Gradescope.

**Make-up work:** Exams, homework and other graded work cannot be easily made-up with a class of this size. That is why one exam and two homework sets will be dropped. See me in the event of extenuating circumstances.

### **Extra credit Opportunity:**

Attend a lecture on Medicinal Chemistry & Drug Development by a W&M Senior Chemistry student on the following dates from **4.00pm – 5.50pm in ISC 1127** and earn 5 pts on each day for a max of 10 pts:

- Wednesday, April 6<sup>th</sup>
- Wednesday, April 13<sup>th</sup>
- Wednesday, April 20<sup>th</sup>

If you have a W&M class/lab conflict with these days or another official W&M function (athletics related, conference visits (not including social events)) please contact me at the LATEST by Thursday, February 10<sup>th</sup> (or come to office hours) to see about other arrangements.

**Student Accessibility Services:** Students must contact the Student Accessibility Services in the Dean of Students office to arrange for special accommodations or extra-time during exams.

**Honor Code:** All students are bound to the Honor Code. There will be **zero tolerance for cheating** and all incidences will be reported to the honor system. See the student handbook for more information on the honor code.

**Important dates:**

First day of Class is Thursday, January 27<sup>th</sup>.

Add/drop ends on Friday, February 4<sup>th</sup>.

Last day to withdraw from this course is Monday, March 28<sup>th</sup>.

Last day of Class is Thursday, May 5<sup>th</sup>.

**Final Exam is on Tuesday, May 10<sup>th</sup>, 7 pm - 10 pm.**

**THE KEY TO SUCCESS IN ORGANIC CHEM:  
DOING HOMEWORK & PRACTICE PROBLEMS!**

**Homework assignments:**

Homework will consist of graded and ungraded assignments.

It is **IMPERATIVE** for success in this class to do both graded AND ungraded homework. If you only do the graded homework, you are doing just the **bare minimum**. You can pass the class that way but to get an A or a B you must practice way beyond the bare minimum.

Set yourself aside several hours per week to do practice problems.

**This is really the only way to master organic chemistry!**

**GRADED homework assignments** will be done using **CHEM101**. You have to purchase access for the semester. The costs are \$28 for online purchase and probably a bit higher at the WM bookstore. There will be ten (10) online homework assignments. Each problem-set will be worth 19.5 points. **The lowest two** (2) assignments will be dropped, and your **highest eight** (8) assignments will count for a maximum total of 156 points. Assignments are **due at 11.59 pm** on the dates shown in the schedule below. These dates are subject to change and any changes to the schedule will be announced in class or via email. Late homework assignments will be penalized with a 20% penalty PER DAY of lateness. (i.e. submission at 12.01am is considered one day late all the way until 11.59pm of that day)

To sign up for CHEM101 follow the instructions provided on Blackboard (BB).

**UNGRADED homework assignments** from your workbook and textbook and some created by myself, are assigned to help you prepare for exams. **I HIGHLY recommend doing these!**

1. **Klein Workbook:** Homework problems can be found below. Updates will be emailed to you weekly do you know exactly which problems you can do each week.
2. **Brown Textbook:** Homework problems for each chapter can be found below.
3. **Problems designed by Prof Lashley:** will be posted on BB weekly to be solved in Help-sessions

**The ungraded problems** that I am assigning to you can be found **further below in this syllabus.**

Additionally, supplemental problems will be posted on blackboard or handed out during help sessions.

***IF you find yourself short on time do 1 & 3. But whatever you do, don't skip doing those!***

**Schedule:** You will find a tentative schedule below. **This schedule is subject to change!**

<b>Week</b>	<b>Topics</b>	<b>Brown Ch.</b>	<b>Brown Sections</b>	<b>Klein Chapters</b>	<b>CHEM101 Problems Due</b>
1) Jan 27	Structure and Bonding, Functional Groups	1	1.1-1.4		
2) Feb 1 & 3	Polarity, Resonance, Molecular Orbital Theory Alkane Structure & Drawing <b>Add/Drop Period Ends 2/4</b>	1 2	1.5-1.10 2.1	Chs. 2, 4 Ch. 1	HW 1, 2/4 (F)
3) Feb 8 & 10	Acids and Bases Alkanes and Cycloalkanes: Isomerism	4 2	4.1-4.7 2.2	Ch. 3	HW 2/11 (F)
4) Feb 15 & 17	Alkanes and Cycloalkanes: Conformations, Nomenclature, Geometrical Isomers, Properties and Reactions	2	2.3-2.9	Ch. 5 Ch. 6.1-6.2	HW 3, 2/18 (F)
5) Feb 22 & 24	<b>Midterm Exam 1: Tues., 2/22, 6:30 pm</b> Finish Alkanes Begin Stereochemistry	2 3	2.3-2.9 3.1-3.9	Ch. 6.3-6.7 Ch. 7	HW 4, 2/25 (F)
6) March 1 & 3	Stereochemistry	3	3.1-3.9	Ch. 7	
7) Mar 8 & 10	Alkenes: Structure, Nomenclature & Properties  Reaction Mechanisms (Primer 1, p.213)	5 6	5.1-5.4 6.1- 6.4	Ch. 11	HW 5, 3/10 (R)
Mar 14	SPRING BREAK	-	-	-	-
8) Mar 22 & 24	Alkenes: Reactions	6	6.5-6.7	Ch. 11	
9) Mar 29 & 31	<b>Last Day to Withdraw - 3/28</b> <b>Midterm Exam 2: Tues., 3/29, 6:30 pm</b> Finish Alkenes: Reactions Begin NMR Spectroscopy	13	13.1-13.8		HW 6, 4/1 (F)
10) Apr 5 & 7	NMR Spectroscopy, IR Spectroscopy	13, 12	13.9-13.12, 12.1-12.5		
11) Apr 12 & 14	Finish Spectroscopy Alkyl Halides and Radicals	8	8.1-8.6,8.8		HW 7, 4/15 (F)
12) Apr 19 & 21	Begin Substitution	9	9.1-9.2	Ch. 9	HW 8, 4/22 (F)
13) Apr 26 & 28	<b>Midterm Exam 3: Tues., 4/26, 6:30 pm</b> Substitution and Elimination <b>NOTE: lecture on April 28<sup>th</sup> will be virtual via zoom or pre-recorded</b>	9	9.1-9.2	Ch. 9	
14) May 3 & 5	Substitution and Elimination Alkynes <b>NOTE: lecture on May 3<sup>rd</sup> will be virtual via zoom or pre-recorded</b>	9 7	9.3-9.9 7.1-7.9	Ch. 10 Ch. 12	HW 9, 5/2 (M) HW 10, 5/6 (F)
<b>FINAL EXAM May 10</b>	CUMULATIVE FINAL EXAM <b>block final for all Chem. 206 sections</b> Tuesday, May 10 <sup>th</sup> 7.00pm – 10.00pm Room TBA	ALL covered chapters		ALL covered chapters	

## Suggested End-of-chapter Problems from Klein Textbook 4<sup>th</sup> or 5<sup>th</sup> Edition

### Assigned homework from the Klein workbook relevant for EXAM 1:

#### KLEIN 1<sup>st</sup> semester topics:

You will be asked to work through all the chapters that we will cover. This means reading the chapters and then doing all the problems in those chapters. I will let you know in class and via email when you can get started on a given chapter. Occasionally I will exclude certain problems from Klein – you will be notified via email about this.

## Suggested End-of-chapter Problems from Brown Textbook 7<sup>th</sup> or 8<sup>th</sup> Edition

These are not graded, but exam problems may be similar to these. We will discuss SOME solutions in help-sessions. **I recommend doing ALL other graded & ungraded homework before you start these!**

<b>Ch. 1</b>	31, 32, 41, 45, 46, 47, 48, 49, <b>50</b> , 52, 53, 56, 57, 70, <b>74, 75</b>
<b>Ch. 2</b>	16, 21, 24, 25, 26, 29, 30, 33, 43, 48, 49, 50, <b>64</b>
<b>Ch. 3</b>	16, 17, 18, 20, <b>21</b> , 26, 27, 30, 31, <b>39</b>
<b>Ch. 4</b>	15, 16, 22, 30, 32, 36, 41, 42, <b>44</b> , 45, <b>48, 53</b>
<b>Ch. 5</b>	14, 15, <b>19</b> , 20, 23, 24, <b>35</b>
<b>Ch. 6</b>	15, 17, 18, 19, 21, 24, 26, <b>28</b> , 30, 33, 37, <b>38</b> , 39, 40, 45, 46, 48, 49, <b>51</b> , 54
<b>Ch. 7</b>	8, 10, 11, 12, 16, 17, 20, 23, 25, <b>27</b> , 29, 30, 31, <b>35</b>
<b>Ch. 8</b>	8, 9, 10, 14, 15, 23, 25, 26, 28, 29 30, 32, <b>34</b>
<b>Ch. 9</b>	11, 12, 13, 14, 17, 20, 22, 23, 25, 28, 34, 37, 38, 40, 43, 44, 45, 47, 51, 54, 55, 56, 57 <b>62, 64</b>
<b>Ch. 12</b>	5, 6, 7, 11
<b>Ch. 13*</b>	9, 12, 15, 16, 17*, 18, 20, 21, 24, <b>26</b>

\*Several problems in Ch.13 tell you that the compound decolorizes bromine in CCl<sub>4</sub>. This is a structural clue that tells you the compound is capable of reaction with Br<sub>2</sub> (Ch. 6). In # 17, the “reacts with sodium metal” comment tells you that the compounds are alcohols (as you will learn later in Ch. 10, Orgo 2).

## Mental and Physical Well-Being

William & Mary recognizes that students juggle different responsibilities and can face challenges that make learning difficult. There are many resources available at W&M to help students navigate emotional/psychological, physical/medical, material/accessibility concerns. Asking for help is a sign of courage and strength. If you or someone you know is experiencing any of these challenges, we encourage you to reach out to the following offices:

- For psychological/emotional stress, please consider reaching out to the W&M Counseling Center <https://www.wm.edu/offices/wellness/counselingcenter/>; or (757) 221-3620, 240 Gooch Dr., 2<sup>nd</sup> floor. Services are free and confidential.
- For physical/medical concerns, please consider reaching out to the W&M Health Center at <https://www.wm.edu/offices/wellness/healthcenter/>; or (757) 221-4386, 240 Gooch Drive.
- For additional support or resources, please contact the Dean of Students by submitting a Care Report at <https://www.wm.edu/offices/deanofstudents/services/caresupportservices/index.php>; or by calling 757-221-2510, or by emailing deanofstudents@wm.edu.
- For a list of many other resources available to students, see [Health and Wellness Resources for Students](#)

As your professor, I also ask you to reach out to me if you are facing challenges inside or outside the classroom; I will guide you to appropriate resources on campus.