

## CHEMISTRY 202 - ORGANIC CHEMISTRY II

Spring Semester, 2018

January 16 – May 4, 2018

M,W,F 11:45-12:35

H-353

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**CHM 202 Homepage:** <http://www.lasalle.edu/~price/CHM202.HTM>

### **Texts: Lecture -**

L.G. Wade *Organic Chemistry*, 9th Edition, Pearson, Boston, MA, 2017.

**ISBN10:** 0-321-97137-1, **ISBN13:** 978-0-321-77137-11

**Sapling Learning Homework:** [www.SaplingLearning.com](http://www.SaplingLearning.com)

Sapling Learning Online Homework: \$40.00 for 1 semester.

La Salle University – CHM 202 – Spring18 – PRICE (no enrollment code)

**Instructions for how to enroll:** <http://bit.ly/saplinginstructions>

### **Laboratory -**

J. R. Mohrig, C.N. Hammond, P.F. Schatz, and T.C. Morrill, Custom Laboratory Manual from *Modern Projects and Experiments in Organic Chemistry*, Freeman, New York, 2003.

### **Recommended:**

For those not purchasing the bundle in the bookstore, **Chem-Tutor** Student Modeling System for Organic Chemistry, Aldrich Chemical Co. (available from stock room – limited supply).

### **Course Description and Learning Objectives:**

Chemistry 202 is a course that will build on the foundation that was established in CHM 201. The course will begin with the study of structure, synthesis and reactions of alcohols. *It is important to recognize that much of this continues the substitution and elimination concepts from the fall semester.* We will then focus on structure elucidation using infrared (IR) spectroscopy, mass spectrometry and nuclear magnetic resonance (NMR) spectroscopy. *Much of the Infrared Spectroscopy will be covered by your laboratory instructor.* Take a look at some excellent tutorials and spectroscopy resources on my LINKS page. The course will then continue with the study of different functional groups including ethers and epoxides, followed by conjugated pi systems including pericyclic reactions and aromatic (benzene-type) chemistry. After a brief look at ultraviolet (UV) spectroscopy, the course will continue with examination of structure, preparation, and reactivity of oxygen-containing functional groups within molecules.

The approach used will incorporate orbital analysis (structure), nomenclature, electron distribution and flow (mechanism), practical applications, reactions, and ultimately synthesis.

The amount of material to be covered is quite large, thus it is necessary that you keep up with the course lecture to lecture. We will not cover every section of every chapter – your tests and quizzes and homework will only cover material we have discussed in class. *Your ability to apply abstract material to specific, sometimes new situations is a crucial learning goal in this course.* One cannot expect to succeed by studying the day or two before an exam only. This is an abstract, cumulative subject that requires daily attention. One suggestion is to read the appropriate chapter and print and read the powerpoint slides prior to attending class. This way, the material covered in class will seem somewhat familiar (what a great feeling) and will hopefully clarify any questions you might have. Do as many of the chapter problems in Wade as possible. Do not hesitate to ask questions in class, after class or during any office hour. Use of the study guide is helpful, but only if you first attempt the problems on your own. You must put time into this course in order to succeed. The more problems you do (especially in the spectroscopy portion of the course) the more comfortable you will be with the material.

**By the end of the semester, the student will have facility with:**

- ✓ Structure, synthesis and reactions of alcohols and ethers
- ✓ Structure elucidation using IR, Mass and NMR spectral methods
- ✓ Orbital assessment of conjugated systems including polyenes and aromatic systems
- ✓ Reactions of aromatic compounds
- ✓ Organic synthesis
- ✓ Carbonyl chemistry – aldehydes and ketones
- ✓ Amine chemistry
- ✓ Carboxylic acid and derivatives chemistry
- ✓ Nomenclature of all functional groups covered
- ✓ Condensations and substitutions of carbonyl compounds
- ✓ Mechanisms intrinsic in all of the these functional group transformations

Students of organic chemistry are often overwhelmed by the number of compounds, names, reactions, and mechanisms that confront them. Perhaps the most important skill that you developed in CHM 201 was the ability to *organize, categorize* and *apply*. By learning an abstract concept and having the flexibility to apply it to a variety of similar situations, the amount of memorization is drastically reduced.

The purpose of a good textbook is to organize this vast amount of material into a few basic principles off of which many extensions and applications can be made. Our goal is to become problem solvers or diagnosticians at the molecular level - not memorizers! On successful completion of the course the student will be able to demonstrate competency in the course material, as well as the ability to report and analyze laboratory observations.

### Strategy:

Take notes! The amount of material to be covered is quite large (over 600 text book pages) thus it is imperative that you keep up with the course. Keeping up is most easily accomplished by reading the appropriate chapter prior to attending class. *This is not a course where one can effectively cram immediately prior to an exam.* Work as many of the problems from the book as possible and ask for help when necessary. You may also find that rewriting your lecture notes in a less hurried (and more legible) fashion will help in your retaining and comprehending the material. The powerpoint slides are all posted on our website. You find it easier to either print them ahead of time or use a laptop or i-Pad in class to follow along. You will find the study guide useful only if you attempt the problems on your own first.

### Sapling Learning Homework:

A schedule of homework problems is on the calendar once you enter *Sapling*. **There will be several problem sets assigned throughout the semester.** They will be posted roughly a week before they are due. These may take up to two hours to complete so do not start them at the last minute. You can save your work and come back to it at a later time. A very important new skill that you will continue to use is the ability to *draw molecules using the template drawing tools* supplied in pertinent questions. **The first week**, if you haven't already done so, you should do the modules on "Drawing Tips", "Curved Arrow Overview" and "Stereochemistry Training" so that you are familiar with nuances like subscripts, superscripts, drawing Lewis structures and structures of more elaborate organic molecules (sometimes in 3 dimensions), etc.

### Chapter Sequence and Suggested Problems:

We will cover chapters 10-22 in CHM 202. **Chapter coverage will be selective.** It is the student's responsibility to know what portions of chapters are not covered in lectures and thus not covered on exams.

The text contains an excellent set of problems. It is recommended that you solve the problems in the running text as you read the material (you should use a composition notebook for problems). The recommended problems at the end of the chapters can be used to fine tune your grasp of the material. You will also find many tutorials, practice problems from old exams on the website.

### Grades:

The course consists of both lecture (80%) and laboratory (20%). Your laboratory grade is determined by your laboratory instructor. *In order to pass the course, you must have a passing grade in both parts.* The breakdown is as follows:

4 hour exams	500 pts (50%)
Quizzes	100 pts (10%)
Homework	50 pts (5%)
Final exam	150 pts (15%)
Laboratory	200 pts (20%)

A schedule of exams (every 10<sup>th</sup> lecture) with *probable* coverage is shown below:

Wednesday, Feb. 7	Chapters 10-12
Friday, March 2	Chapters 13-15
Friday, April 6	Chapters 16-18
Friday, April 27	Chapters 19-21

### Final Grades:

Assessment of your performance on the various assignments will culminate in a letter grade (I do use +/- grade system).

Typically, a letter grade of A = 90-100; B = 80-89.9; C = 70-79.9; D = 60-69.9; F < 60.

### Examinations:

Examination questions will be drawn from lecture material, assigned readings, and homework problems. Each of the exams will build off of concepts covered earlier in the course. Therefore, while exams will not be explicitly designed to comprehensively retest all earlier sections of the text, it will be important to remain knowledgeable and competent with previous concepts covered in the course.

**Absence from an examination**, without prior approval, will result in a zero score for the exam. If an emergency occurs the day of the exam, the instructor must be informed within 24 hours (by phone or email). Any questions about whether an absence is excused or not will be at the discretion of the instructor.

### Homework:

**Homework** will be posted on the Sapling Learning site in a timely fashion. Due dates will be posted as well. After the due date, the assignment will be visible, but not be accessible for credit unless you have a reasonable excuse.

**Quizzes** will be take-home and handed out after five lectures of new material between exams. Although the quizzes are open book and open powerpoint slide, you are to work on the quizzes individually – no collaboration. Quizzes are due at the beginning of class according to the schedule below.

### Academic Integrity:

It is your responsibility to maintain a high degree of integrity in your work. Cheating of any kind will not be tolerated and will result in a failure in the course! The following are

considered cheating: (a) Sharing of results and answers on lab reports, graded assignments, quizzes and exams; (b) Use of unauthorized materials during an exam (cell phones included); (c) Plagiarism, including copying a fellow student's lab report or homework. When in doubt, both parties involved in plagiarism (both the copier and the copyee) will be held responsible for the integrity violation. Please refer to the school's official Academic Integrity Policy for further information as well as the Student Guide to Rights and Responsibilities.

**Students with Disabilities:**

Students with disabilities should refer to the student handbook for resources that are available to them as well as compliance with the American Disabilities Act.

**Writing Center and Tutoring:**

<http://wp.lasalle.edu/learningsupport/>

**Syllabus Change Policy:**

*This syllabus is a guide and every attempt is made to provide an accurate overview of the course. However, circumstances and events may make it necessary for the instructor to modify the syllabus during the semester and may depend, in part, on the progress, needs, and experiences of the students. The instructor will give notice when changes to the syllabus are made.*

**Semester Calendar:**

<b>Monday</b>	<b>Wednesday</b>	<b>Friday</b>
<b>Jan. 15</b> MLK Day	<b>17</b> Intro and CH 10	<b>19</b> CH 10
<b>22</b> CH 11	<b>24</b> CH 11	<b>26</b> CH 11
<b>29</b> CH 12	<b>31</b> CH 12	<b>Feb. 2</b> CH 12
<b>5</b> CH 13	<b>7</b> <b>EXAM I (CH 10-12)</b>	<b>9</b> CH 13
<b>12</b> CH 13	<b>14</b> CH 13	<b>16</b> CH 14
<b>19</b> CH 14	<b>21</b> CH 14	<b>23</b> CH 15
<b>26</b> CH 15	<b>28</b> CH 15	<b>March 2</b> <b>EXAM II (CH 13-15)</b>
<b>5</b> CH 16	<b>7</b> CH 16	<b>9</b> CH 17
<b>12</b> Spring Break	<b>14</b> Spring Break	<b>16</b> Spring Break
<b>19</b> CH 17	<b>21</b> CH 17	<b>23</b> CH 18
<b>26</b> CH 18	<b>28</b> CH 18	<b>30</b> Easter Holiday
<b>April 2</b> Easter Holiday	<b>4</b> CH 19	<b>6</b> <b>EXAM III (CH 16-18)</b>
<b>9</b> CH 19	<b>11</b> CH 20	<b>13</b> CH 20
<b>16</b> CH 20	<b>18</b> CH 21	<b>20</b> CH 21
<b>23</b> CH 21	<b>25</b> CH 22	<b>27</b> <b>EXAM IV (CH 19-21)</b>
30 CH 22	<b>May 2</b> CH 22	<b>4</b> Review

**Important dates:**

Last day to withdraw with a "W" grade, Tuesday, April 3

Wednesday, April 6 will follow a Monday class schedule

Final Exams are during the week of May 7-11

**Missed exams can only be made up with documentation for the absence *and* a note from your academic advisor.**