

## Organic Chemistry for Majors 2

### Chemistry 48

**Instructor:** Andrew Korich; Office: Innovation Hall 348; andrew.korich@uvm.edu

**Pronouns:** he/him

**BlackBoard Site:** bb.uvm.edu

**Lecture:** MWF 10:50-11:40 am in Innovation E432

**Office Hours:** Monday/Wednesday 11:40am – 12:20 pm, Friday 11:40 – 2 pm, or by appointment

#### Required Course Materials

- Organic Chemistry 7th ed., Loudon and Parise, Roberts and Co., 2021 (ISBN: 978- 1319363772)
- Organic Chemistry Study Guide and Solutions Manual 7th ed., Loudon and Parise, Roberts and Co., 2021 (ISBN: 978-1319335915)
- Achieve account: account can be purchased as part of book order.

#### Recommended Course Materials

- Molecular Structure Models (e.g.: ISBN: 0471-362719)

**Course Prerequisites:** Chemistry 47

#### General Course Comments

In Chemistry 48 we continue to explore the basic principles of Organic Chemistry with a greater emphasis on the chemical reactivity of various functional groups (i.e. more similar to the last 1/3 of the first semester course).

By now you have probably noticed that Organic Chemistry involves many new concepts, a large number of rules and a very large number of reaction mechanisms. However, as the course progresses and your organic “repertoire” grows, you will also find that a relatively small subset of rules serves to tie together the vast amount of information contained in the text. A special effort made at the beginning of the course to review and master important concepts from Chemistry 47 will pay off as the course progresses. Topics that are especially important to review include:

Arrow Pushing: Arrow pushing is one of the most important “tools” of organic chemistry because it allows you to show a pictorial representation of a reaction mechanism. When done properly, arrow pushing will allow you to keep track of **electrons** as bonds are made and broken throughout the course of a reaction, as well as keep track of any formal charges that develop. Having a good grasp of arrow pushing will make learning the large number of reactions you will see in this course easier, because you will then understand the

molecules react the way they do, and a good understanding of the rules for writing proper contributing “structures” to resonance hybrids will make the understanding of reaction mechanisms considerably easier. In order to have a good understanding of resonance you must also have a good grasp of electronegativity and arrow pushing.

Electronegativity: Knowledge of the relative electronegativities of atoms is essential to understanding why molecules react the way they do. For example, the concept of electronegativity allows you to rationalize why some atoms are good leaving groups and others are not.

Chemical Reactions: You will be expected to know all the chemical reactions we covered in Chem. 47.

Nomenclature: I will assume you know the names of all the functional groups as well as the standard IUPAC rules for

Stereochemistry: Determining R/S designations as well as E/Z. Understanding the difference between different types of stereoisomers (enantiomers/diastereomers) and being able to correctly identify the stereochemical relationship between compounds (i.e. are they diastereomers, enantiomers, constitutional isomers, different molecules, etc.).

### Keys to Success

- Do not try to cram!
- **Work as many practice problems as possible.** Practice problems reinforce the new concepts and are the only way to test your understanding of the material. There are many organic chemistry textbooks in the library and they all cover similar material. Work problems in other books once you have finished the problems in our book.
- Do not look at a problem's answer until you have really tried the problem. After seeing the answer, it often seems obvious and you may assume you understand.
- When you get a problem wrong, try to understand where your thinking was in error and attempt to identify what concept you missed.
- You will see many new concepts in this course. Try to write out an explanation of the concepts in your own words as if explaining them to someone else.
- Ask questions! Come to office hours or make an appointment with me or your T.A. to resolve any questions early!
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Thursdays from 1:15 - 5:15. The exams will held on:

- February 16<sup>th</sup>
- March 23<sup>rd</sup>
- April 20<sup>th</sup>

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: Friday, May 12<sup>th</sup>, 10:30 - 1:15 in Innovation E432

1. Students will demonstrate general knowledge in chemistry and will be able to apply chemical and physical principles in the solution of qualitative and quantitative chemical problems.
2. Students will understand the interplay of observational data, hypotheses, and hypothesis-driven experimentation through application of the scientific method.
3. Students will become proficient in chemical laboratory techniques and be able to apply these to practical and current problems in research.
4. Students will be able to read and critically evaluate the chemical and scientific literature.
5. The students will learn to present scientific data clearly and effectively through both written and verbal communication.

Religious Holidays: Students have the right to practice the religion of their choice. Each semester students should submit in writing to their instructors by the end of the second full week of classes their documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observance to make up this work.

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**NOTE:** The following two chapters cover material you will see in CHEM 052. *However, you will be responsible for knowing this material for our class. We will work some practice problems in class and in lab, but your primary introduction to this material will occur in CHEM 052:*

**Chapter 13:** Introduction to spectroscopy. IR and MS All sections (13.6C will not be covered in depth)

**Chapter 14:** Nuclear Magnetic Resonance Spectroscopy

