

Text: Author: David Klein  
Organic Chemistry, 4<sup>th</sup> Edition (earlier editions are acceptable)  
Solutions Manual (Strongly recommended, but make sure edition matches book)  
Organic Chemistry as a Second Language (Recommended, 2<sup>nd</sup>-6<sup>th</sup> editions)

Homework: Wiley Plus

Model Kit: Any approved model kit (Strongly Recommended)

Calculator: Basic scientific calculator  
Calculators are not allowed on exams unless specified.

Class: T/Th 9:30 AM-10:45 AM MSCI 204

Final Exam:

Dr. Kawagoe's Office Hours Schedule

| Days | Hours      | Room |
|------|------------|------|
| MTh  | 2-3 PM     | S220 |
| F    | 10AM-12 PM | S208 |

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You should read and understand pages (Page 45-51, RC 2022-23 Online catalog). These pages outline the college policy and rules regarding Student Conduct, Academic Dishonesty, Attendance, and Withdrawing from College. You are responsible for knowing all that is discussed there.

### **Attendance Policies**

I may drop students who do not attend the first day of class. If during the first two weeks of class you miss two consecutive lectures, you will be dropped from the course. Following the first two weeks, if you accumulate four unexcused absences, you will be dropped or your grade will be lowered by one letter grade.

### **Academic Dishonesty**

Cheating will not be tolerated. You will receive an "F" for the course and be reported to the Dean of Students.

### **Exams**

There are three midterm exams\*. See the lecture schedule for a list of chapters covered on each exam. All exams are cumulative but emphasize the most recent material. **Exams may take more than the 75 minutes allotted to the class time. You will be allowed at least 120 minutes for each exam. Please make arrangements with me if this does not fit in your class schedule.**

\*The final exam may consist of will be cumulative.

|          |                  |
|----------|------------------|
| Exams    | 65%              |
| Final    | 20% (cumulative) |
| Homework | 15%              |

No exams scores are dropped in calculating your final grade. If you miss an exam, you will receive zero points for that exam. To make up an exam score, you must provide written evidence and a contact name and phone number that I can call to verify the reason for the absence.

### **Homework and Extra Credit**

Homework will be assigned via Wiley plus. See Canvas for details.

Prior to each exam, you are required to turn in your work for the online homework. This can be done on notepaper, notebook, or tablet. It needs to be **organized (by chapter and question and question number)** and **reasonably** complete and neat. **This is 25%% of the homework grade.** You do not have to show your work for the adaptive assignments.

## **Exam Corrections**

- You will have one week from the day I hand back your exam to submit corrections.
- Corrections will be done on a separate sheet (or copy of the exam), not the exam.
- You need to redo all the problems on the exam.
- Corrections are required for all the questions that you did not receive full credit.
- Each correction needs to include:
  - the fully corrected answer.
  - Where you made the mistake and why (this needs to be specific, thoughtful, and not flippant).
  - reference to the source of the answer in the text or notes (give date). Do not give the exam key as the source.
- When you turn in the corrections, staple the corrections to the front of the exam.  
What you get: *I will award up to 5% additional credit per exam.*

## **Grades**

Grades will be assigned according to the following scale.

| Grade percentage |          |
|------------------|----------|
| A                | 100%–89% |
| B                | 88%–77%  |
| C                | 76%–66%  |
| D                | 65%–54%  |
| F                | < 54%    |

I may adjust the up or down during the semester.

## **Important dates**

- Martin Luther King Day - Monday 1/16/23
- Lincoln Day - Friday 2/17/23
- Washington Day - Monday 2/20/23
- Spring Break 4/3 - 4/6 no classes. Campus open M-Th.

### **Final Exam**

- Tuesday 5/17/23 9-10:50 AM

## **Accommodations**

If you have a verified need for an academic accommodation or materials in alternate media (i.e. Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible. If you think you have a learning disability but have not had it verified, Disabled Students Programs and Services (DSP&S) might be able to assist you. All information will be kept confidential.

### Tentative Lecture and Exam Schedule

The class schedule is currently in flux! We will discuss examination methods in class during the first week.

| Week                    | Lecture Material                                      |
|-------------------------|---|
| Week 1<br>1/9/23        | Ch 13. Ethers and epoxides                            |
| Week 2<br>1/16/23       | Ch 16. Conjugated pi systems and pericyclic reactions |
| Week 3<br>1/23/23       |   |
| Week 4<br>1/30/23       | Ch 17. Aromatic Compounds<br>Exam 1 (Ch 13 & 16)      |
| Week 5<br>2/6/23        | Ch 18. Aromatic Substitution Reactions                |
| Week 6<br>2/13/23       |   |
| Week 7<br>2/20/23       | Ch 19. Aldehydes and Ketones<br>Exam 2 (Ch 17 & 18)   |
| Week 8<br>2/27/23       | Ch 20. Carboxylic acids and their derivatives         |
| Week 9<br>3/6/23        |   |
| Week 10<br>3/13/23      | Ch 21. Alpha Carbon Chemistry<br>Exam 3 (Ch 19 & 20)  |
| Week 11<br>3/20/23      |   |
| Week 12<br>3/27/23      | Ch 22. Amines   |
| Spring Recess<br>4/3/23 | No Class  |
| Week 13<br>4/10/23      | Exam 4 (Ch 21 & 22)                                   |
| Week 14<br>4/17/23      | Ch 24. Carbohydrates                                  |
| Week 15<br>4/24/23      | Ch 25. Amino Acids, Peptides and Proteins             |
| Week 16<br>5/1/23       | Ch. 26. Lipids  |
| Week 17<br>5/8/23       | Exam 5 (Ch 24-26)                                     |
| Week 18<br>5/15/23      |   |

Official Course Description (Sometime useful to show to a transferring institution)

Course Description: This is the second semester in a year-long course in organic chemistry designed for students majoring in chemistry and related disciplines, such as premedical, prepharmacy, pre dental, biology, biochemistry or chemical engineering. It covers the study of several groups of compounds in organic chemistry including aromatic compounds, benzene derivatives, carbonyl compounds, amines, amino acids, lipids, and nucleic acids. Each group is analyzed in terms of their structure, physical properties, nomenclature, reactions and reaction mechanisms. Also included are the oxidation-reduction of organic functional groups and protecting groups in multistep syntheses. PREREQUISITES: Chemistry 28A. ADVISORIES: English 1A or 1AH. (A, CSUGE, UC, I) (C-ID CHEM 160: CHEM 28A+CHEM 28B+CHEM 29A+CHEM 29B)

Learning Outcomes

1. Explain how DNA sequencing is performed and what its role is in the current developments in biochemistry.
2. Write the reaction mechanism of an electrophilic aromatic substitution using Lewis structures and curved arrow notation.
3. Predict the products of reactions, and multistep reactions, of aromatic compounds.
4. Identify and predict the properties and reactions of the building blocks of bio-molecules such as carbohydrates, lipids, amino acids, proteins and nucleic acids.
5. Predict the products of reactions, and multistep reactions, involving the carbonyl functional group such as aldehydes, ketones, carboxylic acids and their derivatives.

Course Outline

- A. Conjugated Dienes and Diels-Alder reaction
- B. Aromatic compounds; Hückel rule, benzene stability, nomenclature of benzene derivatives, reactions at the benzylic position, electrophilic substitution, activating and deactivating groups, multiple substituents, nucleophilic substitution, multistep reactions and mechanisms, IR and NMR spectroscopy.
- C. Aldehydes and Ketones: nomenclature, preparation, properties, nucleophilic addition reactions, multistep reactions and mechanisms, IR and NMR spectroscopy.
- D. Carboxylic acids and their derivatives (acid anhydrides, esters, amides, nitriles): nomenclature, preparation, properties, reactions, multistep reactions and mechanisms, IR and NMR spectroscopy.
- E. Enols and Enolates: alpha halogenation, Aldol and Claisen condensations, alkylation at the alpha position, conjugate addition reactions, multistep reactions and mechanisms.
- F. Amine nomenclature, preparation, physical properties, reactions, multistep reactions and mechanisms, IR and NMR spectroscopy.
- G. Macromolecules: polymers and polymerization
- H. Bio-molecules: carbohydrates, lipids, amino acids, and proteins
- I. Nucleic acids, DNA

The laboratory section is a separate course, CHEM29B