

Spring 2019 Chemistry 8A

Instructor: Dr. Kirk Kawagoe (dr.k)

Office: Soc 38

Email: via Canvas

Class schedule

§59124 Lecture – T/Th 9:30 – 10:45 AM. Phy 77

Office Hours

W 10:30-11:30 AM Th 11 AM – 12 PM
F 12-2:00 PM Su 2-4 PM when possible

Course Materials

- Chemistry: Essential organic chemistry, 2nd Edition. Paula Bruice. ISBN: 9780321596956
- You can borrow the text from me for the semester for \$10. If you can't afford it, just let me know and we can work something out. I'll return the money when you return the book.
- Organic Molecular Model Kit (strongly recommended)
- Scantrons form 882E (letter answers)
- Lecture notes on the course **Canvas** page.
- 2 homework notebooks (required, spiral bound are fine)
- Post-it-note flags (or equivalent)

Attendance Policies

If you are absent four (4) times in the first 9 weeks you will be dropped from the course. In order to be counted as present you must arrive on time, participate and, unless

Final Exams

Your final exam will consist of question types (not usually the exact questions) found in your class exams.

§5/23/19 (Thursday) 10:00 AM – 11:50 AM

Grading and Exams

- ◆ The **grading scale** starts as:
A = 100% - 90%; B = 89% - 80%; C = 79% - 70%; D = 69% - 60%; F = 59% - 0%
Exams, homework, and the final are not curved, but the overall grades in the class may be curved at the end of the semester.
 - ◆ Exams are cumulative with the emphasis being on the most recent material covered.
 - ◆ Exam dates are found in the accompanying schedule, I will try and stick with this exam schedule, but may alter the material covered or dates if necessary. There are no makeup exams. If you miss an exam, you will receive a zero. At the end of the semester, I will replace your lowest exam score with your final exam score.
 - ◆ No one who fails the lab portion of this course (a letter grade of D or lower) will receive a grade higher than a D.
- | | |
|-------------------------|--|
| Class Exams | 70 % |
| Homework and Worksheets | 10 % (+2% extra credit for completing all assignments) |
| Final exam | 20 % |
| <hr/> | |
| Total | 100 % |

Academic Dishonesty

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of an examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

You are encouraged to work together on labs. However, ***your individual work must be evident.*** Do not copy work or allow others to copy from your work. Instances of confirmed cheating will generally result in failure and be referred to the Dean for further action.

otherwise instructed, stay the entire period. In other words, if you arrive late, leave early, or do not participate in activities, you may be counted absent.

Disabled Students Programs Services

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, I will be happy to accommodate you. Contact DSPS to arrange for accommodations.

Homework

You have to get two homework notebooks, post-it note flags and I'll assign problems from the text.

- I won't do a detailed check of your homework, but I expect you do put "effort" into the homework.
- "effort" means reasonably complete and neatly done (as neat as you can manage). Keep in mind that if you make it neat, you spend more time thinking about your answers.
- I expect you to flag answers you want me to take a closer look at.
- At the end of each week (Thursday), you'll turn in your current homework notebook.
- Notebooks will be returned at the beginning of the next week.
- The homework is worth 5% of your grade. If you do all of the problems, I'll give you 2% at the end of the semester. ("all" means 80% of every assignment).

Electronic devices such as cell phones, tablets, etc. are not allowed during exams and must be put away in a backpack or purse; confirmed use of these devices constitutes cheating.

In general, students will get either an F for the course or minus the number of points on the assignment for cheating or plagiarism. The colleges academic dishonesty policy is found in your College Catalog (Pages 49-50, RC 2017-18 Catalog).

Course description

CHEM-8 - Elementary Organic Chemistry

A survey of the important classes of organic compounds with emphasis upon materials of interest to students in the biological sciences. This thorough introduction to organic chemistry is recommended for students who need to take Chemistry 28A or for biology majors, students in prehealth sciences or environmental sciences. PREREQUISITES: Chemistry 1A or 3A.

ADVISORIES English 1A. (A, CSU-GE, UC, I)

Course Hours Per Week: Lecture 3, Lab 0

Semester Hours Credit 3

Learning Outcomes and Objectives

- Analyze simple IR and NMR spectra to determine the structure of an unknown compound.
- Analyze the structural formula and line-bond formula of an organic compound, recognize its functional groups and name it properly using the IUPAC nomenclature.
- Complete the reactions of simple aliphatic and aromatic molecules, including amines and carbonyls.
- Draw structural formulas and line-bond formulas given the systematical name of an organic compound.
- Evaluate the molecular structure of biomolecules such as carbohydrates, lipids, amino acids, proteins and nucleic acids.
- Identify isomers and stereoisomers, recognizing asymmetric carbon atoms that cause chirality.
- Illustrate the mechanism of reactions by correctly writing a balanced chemical equation and when appropriate using arrow notation.

Student Learning Objectives

- CHEM-8 SLO1: Analyze simple IR and NMR spectra to determine the structure of an unknown compound.
- CHEM-8 SLO2: Analyze the structural formula of an organic compound, recognize its functional groups and name it properly.
- CHEM-8 SLO3: Complete the reactions of simple aliphatic and aromatic molecules, showing the reaction mechanisms.
- CHEM-8 SLO4: Draw a structural formula of an organic compound given the systematical name.
- CHEM-8 SLO5: Identify S and R stereoisomers.

Course Outline

- A. Covalent bonding and shapes of molecules.
 - Electronic configuration and orbital diagrams.
 - Lewis structures and formal charges.
 - Polar covalent and non-polar covalent bonds.
 - Intermolecular forces and their effects on physical properties of organic molecules.
 - Hybridization of molecular orbitals (sp, sp², and sp³).
 - Formal charges
- B. Acids and Bases.
 - Lewis and Bronsted definitions.
 - Nucleophiles and Electrophiles.
- C. Alkanes, cycloalkanes and alkyl halides.
 - The basics of organic nomenclature.
 - Classification and properties of alkanes, alkyl halides, alcohols, ethers and amines.
 - Newman projections
 - Chair conformation of cycloalkanes.
- D. Alkenes and alkynes.
 - Nomenclature of organic molecules containing double and triple bonds.
 - Classification of isomers using the cis/trans and E/Z notation systems.
 - Degrees of unsaturation.
- E. Reactions of alkenes.
 - Addition reactions
 - The rule of Markovnikov and its mechanistic background.
 - Hydride shift.
- F. Chirality and stereo-isomerism.
 - Asymmetric carbon atoms and their effects on stereochemical behavior.
 - S and R classification of chiral carbons.
 - Fischer projections
- G. Alkyl halides.
 - Nucleophilic substitution reactions.
 - Replacement of the halogen by nucleophiles such as cyanide, alkoxide, and azide, including the reaction mechanisms.
- H. Benzene and its derivatives.

- Nomenclature
 - Substitution reactions, including reaction mechanisms
 - Reactions of substituted benzene rings considering ortho/para directors and meta directors.
- I. Alcohols, ethers, and thiols.
- Nomenclature.
 - Physical properties.
 - Syntheses and reactions, including reaction mechanisms.
- J. Amines.
- Nomenclature.
 - Physical properties.
 - Simple reactions, including reaction mechanisms.
- K. Aldehydes and ketones
- Nomenclature.
 - Physical properties.
- Syntheses and reactions, including reaction mechanisms.
- L. Carboxylic acids and other carbonyls.
- Nomenclature of carboxylic acids, acyl chlorides, esters and amides.
 - Physical properties.
 - Syntheses and reactions, including reaction mechanisms.
- M. Structure determination.
- Analysis of simple infrared spectra.
 - Analysis of simple nuclear magnetic resonance spectra.
- N. Introduction to bio-molecules.
- Carbohydrates
 - Lipids
 - Amino acids
 - Proteins
 - Nucleic acids.

Chemistry 8 Policies for Spring 2019

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Instructor: Dr. Kawagoe

Office: SO-38

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
13-Jan Week 1	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan
20-Jan Week 2	21-Jan MLK	22-Jan	23-Jan	24-Jan	25-Jan Last day for refund	26-Jan
27-Jan Week 3	28-Jan	29-Jan	30-Jan	31-Jan	1-Feb Last Add/Drop	2-Feb
3-Feb Week 4 (Last Web Drop)	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	9-Feb
10-Feb Week 5	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb Lincoln	16-Feb
17-Feb Week 6	18-Feb Washington	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb
24-Feb Week 7	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar	2-Mar
3-Mar Week 8	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar
10-Mar Week 9	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar Last Drop	16-Mar
17-Mar Week 10 (Web LD)	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar
24-Mar Week 11	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar
31-Mar Week 12	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
7-Apr Week 13	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
14-Apr	15-Apr SPRING	16-Apr BREAK	17-Apr *****	18-Apr *****	19-Apr *****	20-Apr *****
21-Apr Week 14	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
28-Apr Week 15	29-Apr	30-Apr	1-May	2-May	3-May	4-May
5-May Week 16	6-May	7-May	8-May	9-May	10-May	11-May
12-May Week 17	13-May	14-May	15-May	16-May	17-May	18-May Finals Start (Saturday classes)
19-May Week 18	20-May	21-May	22-May	23-May	24-May Semester Ends	25-May

	Tentative Lecture Schedule	Other notes
Week 1	Ch. 1 & 2	Thurs: Turn in Hwk Notebook 1
Week 2	Ch. 2 Cont. Ch. 3	Thurs: Turn in Hwk Notebook 2
Week 3	Ch. 3 (Cont.) Ch. 4	Tuesday - Exam 1 - Ch. 1 & 2 (6-8 written, 8-12 M/C), 45 minutes + lecture. Thurs: Turn in Hwk Notebook 1
Week 4	Ch. 4 (Cont.) Ch. 5	Thurs: Turn in Hwk Notebook 2
Week 5	Ch. 5 (Cont.) Ch. 6	Tuesday - Exam 2 - Ch. 3 & 4 Thurs: Turn in Hwk Notebook 1
Week 6	Ch. 6 (Cont.) Ch. 7	Thurs: Turn in Hwk Notebook 2
Week 7	Ch. 7 (Cont.) Ch. 8	Tuesday - Exam 3 - Ch. 5 & 6 Thurs: Turn in Hwk Notebook 1
Week 8	Ch. 8 (Cont.) Ch. 9	Thurs: Turn in Hwk Notebook 2
Week 9	Ch. 9 (Cont.) Ch. 10	Tuesday - Exam 4 - Ch. 7 & 8 Thurs: Turn in Hwk Notebook 1
Week 10	Ch. 10 (Cont.) Ch. 11	Thurs: Turn in Hwk Notebook 2
Week 11	Ch. 11 (Cont.) Ch. 12	Tuesday - Exam 5 - Ch. 9 & 10 Thurs: Turn in Hwk Notebook 1
Week 12	Ch. 12 (Cont.) Ch. 13	Thurs: Turn in Hwk Notebook 2
Week 13	Ch. 13 (Cont.) Ch. 14	Tuesday - Exam 6 - Ch. 11 & 12 Thurs: Turn in Hwk Notebook 1
Week 14	Ch. 14 (Cont.) Ch. 15	Thurs: Turn in Hwk Notebook 2
Week 15	Ch. 15 (Cont.) Ch. 16	Tuesday - Exam 7 - Ch. 13 & 14 Thurs: Turn in Hwk Notebook 1
Week 16	Ch. 16 (Cont.) Ch. 19	Thurs: Turn in Hwk Notebook 2
Week 17	Ch. 19 (Cont.)	Thursday - Exam 8 - Ch. 15, 16, 19 Thurs: Turn in Hwk Notebook 1
Week 18	Finals week, no lecture.	Final Exam 5/21/19 (Tuesday) 9:00 AM – 10:50 AM