Principles of Organic Chemistry - CHEM 2455
Fall 2018; TR 12:30-1:45, TLC 1301

Instructor: Dr. Vickie Geisler
Email:vgeisler@westga.edu
Office: TLC 2120
Office Hours: T, R 11-12, W 1-5, R 2-5

Supplemental Instructor: Perry Wasdin
Email: **pwasdin1@my.westga.edu**
Office hour: F 9:45-10:45 in the Center for Academic Success

Problem-Solving Sessions: M 3:30-4:30 in the Aquarium (3rd floor of the library), T 5:30-6:30 in TLC 2105
Pre-requisite: Completing CHEM 1212 with a "C" or better. Those registering without the prerequisite may be assigned a grade of W.
Co-requisite: CHEM 2455L

Course Description
This one semester stand alone organic chemistry course intended mainly for biology majors and covers the concepts of a) nomenclature, b) organic structure, c) chemical reactivity of organic compounds with d) an emphasis on the biological applications of these molecules. This one semester course will adequately prepare students for biochemistry. Will not fulfill the organic chemistry requirement for chemistry majors.

Learning Outcomes: Upon completion of CHEM 2455, students will be able to:
1. Identify the various organic functional groups present in the structure of an organic molecule.
2. Give the correct name of an organic compound when provided the structure of the compound, and give the correct structure of a compound when provided the name.
3. Understand basic concepts of structure and bonding in organic compounds, including constitutional isomerism, stereoisomerism, conformational analysis, and structural effects on the physical and chemical properties of organic compounds.
4. Demonstrate specific knowledge of the nomenclature, synthesis, reactions and chemical properties of alkanes, alkenes, alcohols, aldehydes, ketones, carboxylic acids, carboxylic acids derivatives, and amines.

Open access textbook: Organic Chemistry with a Biological Emphasis Soderberg (2016) volume I and II - download PDF free
https://digitalcommons.morris.umn.edu/chem_facpubs/1/
https://digitalcommons.morris.umn.edu/chem_facpubs/2/
Suggested Material: "Preparing for your ACS Exam in Organic Chemistry: The Official Guide" Organic Chemistry As a Second Language: First Semester Topics, and Second semester topics Essential Organic Chemistry by Bruice
Online resources: www.khanacademy.org/science/organic-chemistry

Required Equipment: I>clicker (This is the UWG sanctioned clicker that is used in Biology and other UWG courses). **Bring your clicker to class every day!!** You are responsible for keeping your clicker working. I will drop the lowest clicker quiz and the lowest participation grade so you will not be penalized if you forget your clicker, miss a class, or your clicker does not work.

Sapling Learning: On-line homework $42
1. In CourseDen select the Sapling Learning link found in the Introductory Material (in content). For initial registration, your Sapling Learning homework *must* be accessed through this link.

After logging in once using this link, you can log in to subsequent sessions from our course page or from the Sapling home page.

2. If you already have a Sapling account, enter your username and password in the login box. If the login box is disabled, scroll down to the Create an Account portion of the page, fill in the missing info and click Create My Account.
3. Sapling Learning offers a grace period on payment (14 days from the first day of the term). If it is past the grace period, you will be required to pay before you can access the assignments.
4. During sign up or throughout the term, if you have any technical problems, **o**ur technical support team can be reached by phone, chat, or by email via the Student Support Community. To contact support please open a service request by filling out the webform: https://macmillan.force.com/macmillanlearning/s/contactsupport.

Course Den: Enrolled students will have access to CourseDen where I will post grades, and PowerPoint presentations.

Grading:	Clicker Quizzes (one at start of each lecture)	7%
	Clicker Participation (CP) and worksheets	6%
	Online Sapling homework	7%
	Exams: 9/13 10/16, 11/15	60%
	Final Exam – Thursday, December 13th 11-1	20%
		100 %

- **Note: All clicker quizzes and exams will be taken individually**.
- **Grading Scale:** A: 100-85; B: 84-75; C: 74-60; D 59-50; F: 49-0%
- **Note:** Last day to drop is 11:59 pm Friday, Aug 17th
  Last day to withdraw with a "W" is Oct 8th.

Clicker Quizzes (CQ): At the start of each lecture there will be a 5 point CQ (clicker quiz) over the material covered in the previous class period. Clicker quizzes will be taken individually. Please remain quiet until time is called. **The two lowest quiz score will be dropped**. You will not be excused from any quizzes; there are no make-up quizzes. A quiz missed for any reason and you will earn a zero.

Clicker Participation (CP): After the clicker quiz and during each class there will be several clicker questions. Unlike the clicker quizzes, you are encouraged to work with your group to answer these clicker questions. When you have arrived at an answer you must each individually key in your response. 3% of your grade is determined by your answers to these clicker questions according the following scheme: full credit for a correct response, 75% credit for an incorrect response, 0% for no response. **The two lowest CP score will be dropped**

Worksheets: Students will work on worksheets each class and be asked to turn some of them in at the end of class. Not all of the worksheets will be graded.

Sapling Online Homework: Working problems is an essential portion of the process of studying organic chemistry. You will be required to complete a series of online homework problems. The main purpose of this is primarily to give you an incentive to keep up with the class on a weekly basis. You will have an assignment after each class. All due dates can be found in your Sapling Learning course. You will only earn 50% of the points earned for any late on line homework. The online homework will be delivered using software called Sapling Learning. Paying online is required to use the system. Complete the Sapling Learning training materials. The activities, videos, and

information pages will familiarize you with the Sapling Learning user environment and serve as tutorials for efficiently drawing molecules, stereochemistry, etc. within the Sapling Learning answer modules. These training materials are already accessible in your Sapling Learning course.

Exams: There will be three exams approximate exam dates are: September 13th, October 16th and November 15th. No make-up exams will be given. An exam missed for any reason will result in your final exam counting twice. Each exam will specifically test class material covered since the previous exam. However, since the nature of chemistry is cumulative, I will assume that you have mastered all previous material.

Supplemental Instruction: (Attend SI and earn up to three additional dropped clicker quizzes)

- SI sessions are a fun and interactive way to enhance your understanding of the material.
- Earn 1 SI point for each SI session you attend and participate. You will earn a dropped clicker quiz for your 4th, 9th and 15th SI point earned.

Academic Honesty:

- Having another student use your clicker is a form of cheating, and both/all students involved will automatically lose all possible clicker points for the class (at a minimum see below).
- All exams and clicker quizzes will be closed book/closed notes, and will be taken individually (no help from your group members during quizzes or exams.) Except for extra credit quizzes given on the day after exams.
- During exams you may not use your own paper or other materials except your pen or pencil.
- Visible cell phones during an exam may result in the grade of zero for that exam.
- Academic dishonesty will not be tolerated. Academic dishonesty includes unauthorized use of any materials, notes, sources of information, or study aids or tools during a quiz or exam. It also includes the unauthorized assistance of any person other that the course instructor during a quiz or exam, the unauthorized viewing of another person's work during a quiz or exam, or the unauthorized securing of all or part of any quiz or exam before submission by the instructor.

Calculation of Overall Average:

- Method 1. All grades will be averaged together according the grading scale above.
- Method 2. The lowest exam is dropped from the calculation and the final exam will count in its place.

- **Note:** Last day to withdraw with a "W" is Sept. 29th, before the second exam.

Classroom and Outside-of-classroom Expectations:

- This course will be taught using in class problem sheets in addition to traditional lecture.
- You will be working in self-managed learning groups of three. I will assign group membership and reshuffle groups on a regular basis.
- Each class will begin with a 5-point quiz, individually taken, covering material from the previous class.
- During the group work time I will walk around class, observe, ask and answer questions.
- You must complete each day's worksheets, Sapling Learning homework and assigned readings and problems in Soderberg before the next class period, as they will form the basis of the quiz.
- This course will require *no less than* 12 hours of study time each week, beginning in the first week of the semester. The best way to study is to work problems.

Additional Policies:

- Refer to the student handbook for information on academic support, honor code, email policy, credit hour policy and HB 280 campus carry policy https://www.westga.edu/UWGSyllabusPolicies/
- Students are expected to attend all classes. A large part of the learning process in this course is based on the in-class activities. If you are not here you will not have a chance to participate in those activities. There will be no makeup quizzes – if you miss a quiz you will earn a zero. If you miss a class it is your responsibility to get class material from another student in the class.
- Qualified students with disabilities should contact me as soon as possible to ensure that appropriate accommodations can be made.

Soderberg	**Content**
Chapter 1	Drawing organic structures, Functional groups
Chapter 2	Orbitals and Hybridization, Resonance, Non-covalent interactions
Chapter 3	Conformations, chirality, stereoisomers, meso compounds, Fischer projections, cis/trans
Chapter 5	Acid-base reactions
Chapter 8	Nucleophilic substitution reactions
Chapter 10	Nucleophilic carbonyl addition reactions, Hemiacetals, acetals (glycolytic bonds), Imine (Schiff base), Oxidation and reduction
Chapter 11	Nucleophilic acyl substitution reactions, Carboxylic acids and their derivatives: Nomenclature, acidity, reduction, reactions with nucleophiles, interconversion of derivatives
Chapter 15:	Oxidation and reduction reactions

Tentative Schedule	Content	Reading from Soderberg	Problems from Soderberg
August 16	Structures and Formal Charges	Chapter 1.1A-C	Exercise 1.3-9, and Problems 1.6, 1.8 (exclude b)
August 21	Orbitals and Hybridization	Chapter 2.1	Exercise 2.6-8 and P2.1 and 5
August 23	Resonance, curved arrows	Chapter 2.3,	Exercise 2.9-10, 14-25, and Problems P2.2, 2.4, 2.9-10, 15
August 28	Aromaticity, Physical Properties and Functional groups	Chapter 2.2C, 2.4, 2.5 and Chapter 1.2A	Exercise 2.11-12, 27- 29, 34- 35, 1.12-13 and Problems P2.6 l, 19, 26, 27, 1.8b
August 30	Alkanes, Newman Projections	Chapter 1.1D and 3.1	Exercise 1.10,11, 3.1, 2, and Problems P1.9, 10, and 3.19
September 4	Cycloalkanes	Chapter 3.2	Exercise 3.4-7, and Problems P3.2
September 6	Chirality	Chapter 3.3-3.5	Exercise 3.8-13, and Problems P3.3-17, 20
September 11	Stereochemistry		
September 13	**Exam I**		
September 18	Acids and Bases	Chapter 6.1A and 7.1, 7.3 and 7.2B	Exercise 6.1-2, 7.1-4,6,11-15 and Problems 7.1, 7.3a,b,7.14
September 20	Alkenes, Hydration of alkenes	Chapter 1.2A, 2.1C, 3.9 (no E/Z), 14.1A, 14.1C, 14.1D	Exercise 2.5, 8, 14.5 14.2c,14.4e, Problems 14.1
September 25	One-Step Nucleophilic Substitution	Chapter 6.1B and 8.1-3	Exercise 6.3, 5, 8.5-10, 12, 14,15 and Problems 6.1, 8.1-4, 7
September 27	Two-Step Nucleophilic Substitution	Read Chapter 6.1C, 8.1B, 8.5, 8.6	Exercise 8.2-4 and Problems 8.3, 5, 9, 10
October 2	Two-step Elimination Reactions	Read Chapter 14.2 A-C	Exercise 14.8
October 4	Fall Break	Chapter 14.2 D-E	Exercise 14.9
October 9	One-step Elimination Reactions		
October 11	SN2, E2, SN1, E1	Chapter 8.6, 14.2 E	Exercise 8.18, 14.9. P8.5, 6
October 16	**Exam 2**		
October 18	Nomenclature and physical properties of alcohols, aldehydes and ketones	Chapter 1.2	Exercise 1.15 b, d, e and P1.3 b, c ,f
October 23	Carbonyl Additions	Chapter 10-10.3A, 10.6	Exercise 10.1-7, 9-11, P10.2, 4,5,8
October 25	Carbohydrates, Nitrogen Nucleophiles	Chapter 10-10.3B-10.5	Exercise 10.9-11, 14-15, P10.1,3,6
October 30	Oxidation and Reduction	Chapter 15.1, 3A-E	Exercise 15.3, 10,
November 1	Carboxylic Acid	Chapter 7.3, 13.1, 11.5B, 119A	Exercise 7.14, 13.3
November 6	Carboxylic Acid Derivatives	Chapter 11.1-4, 9A	Exercise 11.1, 2, 4, 10, 14-17, P11.1
November 8	Amides	Chapter 11.5C, 6, 11.9B	Exercise 11.3, 11, 12, 18, P11.1, 4, 7, 8
November 13	Aldol Reaction	Chapter 12.1, 3, 4	Exercise 12.6, 8, P12.3, 12.5
November 15	**Exam 3**		
November 20-22	Thanksgiving		
November 27	Amines		
December 4	Biomolecules	11.4	
December 6	Review		
December 13, 11-1	**Final Exam**		