

A Survey of Organic Chemistry

CHEM 1315 – Fall 2015

Lectures: Tuesdays and Thursdays ; 3:05-4:25 PM
Clough Commons: 144
Office Hours (ES&T 2354 or 2372): Monday 12:00 -2:00 pm
Online platform piazza:
<https://piazza.com/gatech/fall2015/chem1315a/home>

INSTRUCTOR

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TEACHING ASSISTANT

Posted on T-square.

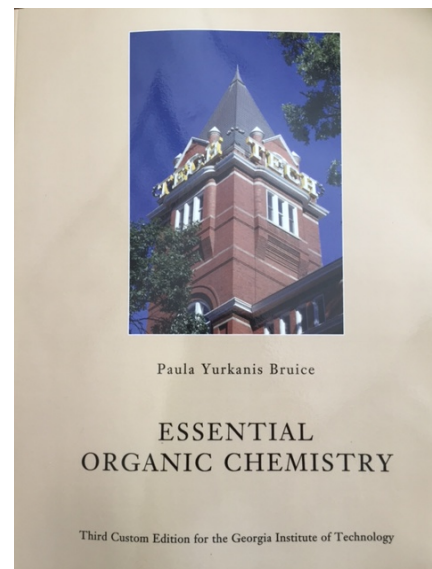
COURSE DESCRIPTION

CHEM 1315 is a 3-credit lecture-based course. The prerequisite is CHEM 1211K or CHEM 1310 or equivalent. The course is intended to introduce you to the major concepts in organic chemistry and prepare you for the biochemistry and polymer chemistry classes you will face in the coming semesters and in your research. You will also acquire a scientific literacy and taste.

- THIS COURSE DOES NOT FULFILL THE ORGANIC CHEMISTRY REQUIREMENTS OF CHEMISTRY, CHEMICAL ENGINEERING AND BIOLOGY CURRICULA AT GEORGIA TECH.
- IT DOES NOT SATISFY THE ADMISSION REQUIREMENTS FOR MOST MEDICAL SCHOOLS.
- PRE-MED STUDENTS, AND THOSE IN CHEM, CHBE, BIOL MUST TAKE CHEM 1212K-2311-2312-2380

This class is very demanding. We will cover a lot of material VERY fast. The class is designed such that you have to review the class notes and read the book chapters for AT LEAST four or more additional hours every week. Therefore, a ten-hour weekly commitment to this class is expected (class meeting, preparations, homework sets etc.). It is important that you start to review the material early on as organic chemistry is cumulative and highly interrelated.

Recitations: There will be weekly optional recitations lead by teaching assistant.



Recitations are complement to lecture. Whereas lectures covered much material and may give limited opportunities for individualized engagement and specific questions, recitation holds smaller numbers of students and is aimed to address anything covered during lecture or individualized studying that is unclear. Recitations are safe platforms to ask questions for clarification on concepts covered in lectures, their applications, and specific problems. The times and locations will be posted on T-square.

REQUIRED COURSE MATERIALS

Item A: The following course materials are bundled together with mastering chemistry and available at the GT Barnes and Noble, GT Engineers bookstores and online.

Book: "Essential Organic Chemistry" by Paula Y. Bruice, Third custom edition. ISBN 9781323116814 or 9781323116818. Used textbook "Essential Organic Chemistry", 1st or 2nd custom edition, by Paula Y. Bruice can be used (the table of the chapters equivalents is posted on T-square).

Item B: We will also use PRS transmitters, which you can also purchase at the GT Barnes and Noble and GT Engineers bookstores.

If you purchase a used PRS unit, don't forget to change the GTid in the unit to you own. Go to setup menu, scroll to ID and press enter to modify to your 9 digit GTid number.

Personal Response System (Rf-PRS) transmitter:

A Personal Response System (PRS) transmitter will be required for quizzes throughout the term. Do not borrow another student unit as the system will credit the data only to the student registered with the unit. For your participation to be recorded you must answer the questions (simply joining the session will not record participation). PRS will be used to support and promote participation, direct discussion and assess understanding. PRS questions will count for 50 points and will be graded as follow:

Wrong answer: 1 point

Correct answer: 2 points

No (or absent) answer: 0 point

MODEL KITS (Recommended but optional)

Many students find model kits useful when studying organic chemistry (3-D stereochemistry). You do not need an expensive kit. A small selection of atoms and bonds is useful. Model kits could certainly be shared. The bookstore(s) has Prentice Hall molecular model kits.

POLICIES, PROCEDURES AND GRADES

There are 4 mid-term exams (E1-4) and a final exam (F). Each mid-term exam will count for 100 points and the final will count for 200 points. The lowest score from the mid-term exams will be dropped. Thus, only the three highest mid-term exam grades will count.

- (1) There will be 4 homework assignments each worth 25 points. All homework assignments will be graded. Homework counts for 100 points of the total final grade.
- (2) PRS will be used to promote participation, direct discussion and assess understanding. PRS questions will be graded and will account for total of 50 points.
- (3) If a student has turned in **ALL** homework assignments on the designated due dates and has an average score of 90 or higher on **ALL** four of the mid-term exams, then the student will be exempt from the final exam and will receive a letter grade of "A" in the course.
- (4) For those students who are not exempt from the final, the course will be graded on the basis of 650 points.

Exam 1	Topic 1: Introduction to organic molecules	100 points
Exam 2	Topic 2: Acid and Base, introduction to organic reactions and mechanisms	100 points
Exam 3	Topic 3: Carbonyl group, carbohydrates and amines	100 points
Exam 4	Topic 4: Amino acids and nature's macromolecules	100 points
Homework	4 HW Sets, 25 points each	100 points
PRS questions		50 points
Drop lowest	Drop lowest exam	-100 points
Final Exam	Comprehensive Chapters	200 points
Course Total		650 points

Score (out of 650) = HW + PRS + E1 + E2 + E3 + E4 + F - lowest mid-term score

- 552 points (85%) will guarantee an "A"
- 455 points (70%) will guarantee a "B"
- 390 points (60%) will guarantee a "C"
- 325 points (50%) will guarantee a "D"

All of the problems in the exam will be similar to those in the book, the on-line practice exercises, and/or covered in lecture. The processes by which you can solve the problems will be exactly the same as those in the book. Work as many problems in the text as practical. The on-line student solutions manual will help. Exam questions may be taken directly from the text. You must understand the processes required to answer assigned problems to do well on exams. Practice questions for each topic. The best use of these practice exercises and quizzes is to study for the exam. Use these to convince yourself that you understand the fundamental concepts.

Late and missed Exams: There will be no make-up exams for the midterm exams unless you have an official notification, if possible from the Dean of Students office. The only valid reasons for missing an exam are illness, official Tech business and out-of-town job interviews. Students unable for any reason to attend a scheduled examination must inform the instructor in a **timely manner**, in advance if possible. Make-up exam will only be scheduled contingent of (1) mutual prior arrangement or (2) documentation of exceptional circumstances. Any make-up exams must be administered before the exams are returned to the class. Exams not made-up by this time, for any reason, will receive a score of zero and will be the drop grade for the class.

Regrades:

Regrade requests (for homework and exams) must be submitted within one week after the assignment was made available to pick up. All regrades requests must be submitted according to the following procedure. Write a summary of what you want regraded (question number), an explanation of why your answer is correct, and attach this page to the front of the assignment. Turn in the request to Dr. Pollet. Please note that when you submit something for a regrade the entire assignment is subject to regrading. If a grading mistake is discovered that resulted in you receiving too many points, your grade could be lowered. Regrade requests will NOT be accepted after one week after the assignment was returned, even those for math errors.

Lecture Attendance & Class notes:

It is strongly recommended that you attend all lectures.

All pre-lecture notes will be posted on T-square at the beginning of the term. Pre-lecture slides for each chapter should be downloaded from the web and printed prior to the first lecture dealing with the material. These notes are not designed to be comprehensive. In fact, they are specifically designed to be incomplete and be used as the basis for lecture notes.

Homework:

Homework assignments will be available at the beginning of the term on T-square. ***Homework assignments are due at the beginning of class on the due date (see schedule).***

Students are encouraged to work together on homework; the purpose of the problems is to develop a clear understanding of the concepts covered in class. The exchanges of information and ideas have been found to support active learning. However, each student must submit his own homework. There will be opportunities to discuss problems in class and review sessions.

Late and missed homework: Late homework will NOT be accepted. Any student unable for any reason to meet homework's deadline must promptly inform to the instructor, in advance if possible.

In-Chapter (not graded)

You should work the problems in each reading assignment as you get to them. Suggested problems at the end of the chapter are listed above and posted on T-square for older editions. You should work through as many of these as possible. These will serve as a guide for the types of questions to appear on examinations. The complete solutions manual is available on the Pearson site.

ON-LINE DISCUSSION BOARD

We will use the platform piazza.com as on-line forum to share questions you may have about the course. Everybody can post questions and answers. We will attempt to contribute to the forum on a daily basis. To sign up use the following link:
<https://piazza.com/class/icm8c8ceghv5ji>

Once you have signed up you can access the Piazza forum via T-square or
<https://piazza.com/gatech/fall2015/chem1315a/home>

COURSE WEBSITE

T-square can be accessed via Tsquare.gatech.edu. Included on the site will be course information, course schedule, practice exam assignments, lecture notes, videos, link to piazza forum, link and information for MasteringChemistry, and grades.

MATERIAL COVERED / STUDENT RESPONSIBILITIES

You are responsible for all material presented in lectures and in assigned readings. You are also responsible for announcements made in class, which will also be posted on the course web page(s) and distributed by email. You must check the web site and your email account on a regular basis.

STUDENT CLASS ACCOMMODATIONS

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements are encouraged to register with ADAPTS-Disability

Services Program at (404)894-2564 or www.adapts.gatech.edu and contact Dr. Pollet to discuss access issues.

GEORGIA TECH ACADEMIC HONOR CODE

For Graded Homework Assignments: You may work with others in developing approaches to solve problems, but submitted work must be your own.

For Tests: Students are reminded of the obligations and expectations associated with the Academic Honor Code and Student Code of Conduct, available online at:

http://www.deanofstudents.gatech.edu/integrity/policies/honor_code.php

<http://www.deanofstudents.gatech.edu/codeofconduct>.

For any questions involving these policies, please discuss them with the instructors.

COURSE OUTLINE

	Lecture	Description	HW	Pre-lecture reading
Topic 1: Introduction to organic molecules				
Aug. 18	1	Electronic structure, bonding		Chapter 1
Aug. 20	2	(octet rules, type of bonding, intermolecular forces and resonance)		Chapter 7 (7.3-7.7)
Aug. 25	3			Chapter 7 (tutorial)
Aug. 27	4	An introduction to functional groups (includes aromatic)		Chapter 3 (3.1-3.6)
Sep. 1	5	Intermolecular Forces		Chapter 3 (3.7-3.13)
Sep. 3	6	Stereochemistry	HW1-due	Chapter 4
Sep. 8	7	EXAM 1		
Topic 2: Acid and Bases: an introduction to organic reactions and mechanisms				
Sep. 10	8	Bronsted and Lowry acids		Chapter 2 (2.1-2.8)
Sep. 15	9	Relationship between structure and acidity		Chapter 7 (7.8-7.9) & Chapter 2 Tutorial
Sep. 17	10	Introduction to mechanisms: Ionic reactions & transitions state theory, concept of catalysis		Chapter 8 (8.1-8.5)
Sep. 22	11			Chapter 8 (8.6-8.11)
Sep. 24	12			Chapters 5 & 6 (5.3-5.9 & 6.1-6.5)
Sep. 29	13	Radical reactions & introduction to polymers		Chapter 14 & 15
Oct. 1	14	Invited lecture	HW2-due	
Oct. 6	15	EXAM 2		
Topic 3: Carbonyl group and amines				
Oct. 8	16	Carbonyl Reactivity		Chapter 11 (11.1-11.5)
Oct. 13		Fall Break		
Oct. 15	17	Carbonyl reactivity: carboxylic acids and derivatives		Chapter 11 (11.6-11.14)
Oct. 20	18	Carbonyl reactivity: aldehyde and ketones		Chapter 12
Oct. 22	19	Carbonyl Reactivity: reaction at α -carbon		Chapter 13
Oct. 27	20	Amines		Chapter 9.1 & 9.10
Oct. 29	21	Invited lecture	HW3-due	
Nov. 3	22	EXAM 3		
Topic 4: Amino acids and nature's macromolecules				
Nov. 5	23	Carbohydrates		Chapter 16
Nov. 10	24	Amino acids: Structure & Properties (pka, isoelectric point)		Chapter 17 (17.1-17.4)
Nov. 12	25	Synthesis of peptides		Chapter 17 (17.6-17.8)
Nov. 17	26	The peptide bonds & structural implications		Chapter 17 (17.9)
Nov. 19	27	EXAM 4		
Nov. 24	28	Invited lecture	HW4-due	
	30	Thanks giving Break		
	31	Review		
	32	Review		
		FINAL : December 10 ; 11:30 am -2:20 pm		

REVIEW SESSIONS

Date	Time	Location
Friday Sept. 4	12:00-2:00	MSE 1224
Monday Oct. 5	12:00-2:00	MSE 3201A
Monday Nov. 2	12:00-2:00	MSE 3201A
Wednesday Nov. 18	12:00-2:00	MSE 3201A