Syllabus: CHEM 2311 RBS-Organic Chemistry I (3 semester credits)

Fall 2026-Georgia Tech Barcelona Spain Fall Study Abroad Program

INSTRUCTOR

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COURSE DESCRIPTION

CHEM 2311-Organic Chemistry I provides an introduction to the fundamental principles of organic chemistry, with emphasis on the relationship between molecular structure, physical properties, and chemical reactivity. Topics include bonding and molecular geometry, nomenclature, stereochemistry, conformational analysis, acids and bases, functional groups, and the mechanisms of substitution, elimination, and addition reactions. Students will also be introduced to basic spectroscopic methods, including infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy, for the identification and analysis of organic compounds. The course emphasizes the development of problem-solving skills, mechanistic reasoning, and the application of core concepts to chemical transformations relevant to the life sciences, materials science, and related disciplines.

COURSE LEARNING OUTCOMES

Students in the course will be able to:

- Describe and apply fundamental principles of organic structure and bonding, including hybridization, resonance, molecular geometry, and conformational analysis.
- Identify, name, and classify common organic compounds and functional groups using standard IUPAC nomenclature and structural representations.
- Analyze stereochemical relationships and predict stereochemical outcomes in organic molecules and reactions, including chirality, enantiomers, diastereomers, and conformations.
- Explain and predict the mechanisms and products of key organic reactions, including substitution, elimination, and addition reactions, using curved-arrow notation and mechanistic reasoning.

- Interpret basic spectroscopic and structural data (such as IR, NMR, Mass Spec.) to determine the identity and structural features of organic compounds.

TEXTBOOKS/SUPPLIES

"Organic Chemistry", 5th edition, by David Klein and "Student Solution Manual and Study Guide".

MODEL KITS (Optional): Many students find model kits useful when studying organic chemistry. You do not need an expensive kit. A small selection of atoms and bonds is useful. Model kits could certainly be shared.

CLASS NOTES: Notes for each topic should be downloaded from the web (as PDF files) and printed (unless you can make annotations on a writable tablet). Topics correspond closely to the chapters, with a little reorganization. *These notes are not designed to be comprehensive.* In fact, they are specifically designed to be incomplete. The downloaded templates allow each student to make annotations while watching the prerecorded and/or live lectures.

SCHEDULE

The course will include lectures (prerecorded online lectures/problem sessions and in-person problem-based lectures), homework assignments, and exams. The total course contact is equivalent to 37.5 hours (i.e., 3 semester credits at Georgia Tech). See the course summary calendar on the canvas homepage for a schedule of lectures.

PRE-RECORDED LECTURES: ***You are expected to have viewed the pre-recorded lectures and make annotations to your notes (as well as read the textbook) prior to live (synchronous or in-person) lectures.*** Students spend approximately 1-2 hr each weekday reviewing the pre-recorded material. In-person lectures will focus heavily on solving problems and answering questions related to the prerecorded lectures and associated readings in the textbook.

GRADES

- Exam 1: Topics 1 and 2 (Structure and Bonding, Organic Compounds) = 100 points
- Exam 2: Topics 3 and 4 (Alkanes and Stereochemistry) = 100 points
- Exam 3: Topics 5 and 6 (Acids/Bases, Nucleophilic Substitution) = 100 points

- Exam 4: Topics 7 and 8 (Elimination and Addition Reactions) = 100 points
- Exam 5: Topic 9 (Molecular Structure Determination) = 100 points
- Homework = 100 points
- Final Exam = 200 points

The lowest score (i.e., 100 points) from exams 1,2,3,4,5, or HW will be dropped. Thus, the course will be graded based on 700 points:

90% (630 points) will guarantee an "A"

80% (560 points) guarantees a "B"

70% (490 points) guarantees a "C"

60% (430 points) guarantees a "D"

Final Exam Options:

If you score 450 points (90%) on Exams 1-5 and the HW (dropping the lowest score) **AND** have a score on each assignment (Exams 1-5 and HW…no drops) of ≥80!, you will receive an "A" for the course upon successful completion of the final course assessment exam (i.e. 15 multiple choice questions) **and CIOS course survey**. You will be notified if you satisfy this option.

If you score 400 points (80%) on Exams 1-5 and HW (dropping the lowest score) **AND** have a score on each assignment (Exams 1-5 and HW….no drops!) of ≥70!, you have the option of receiving an "B" for the course upon successful completion of the final course assessment exam (i.e. 15 multiple choice questions) and **CIOS course survey**. If you choose this option, you must indicate this as your option in writing to Dr. Tyson. Note: If you choose to take the final, your course grade may change (i.e., there is no guarantee it will remain a "B").

LECTURE ATTENDANCE AND PARTICIPATION

Homework will be available on the course website with deadlines posted. Instructions on how to submit your homework will be provided on each assignment.

EXAMS: SCHEDULE, MAKE-UPS, AND DROPS

You must take the exam at the assigned date/time. *Make-ups can only be given if advance notification is given or upon documentation of illness or emergency which prevents you*

from taking the exam. Exams not made-up, for any reason, will receive a score of zero. **Since this course is offered as part of a study abroad program, dropping the course is not permitted without permission of the program director. In addition, Institute policies regarding Final Instructional Class Days and Reading Periods are not applicable. Be sure to review the academic course schedule for this study abroad program.**

REGRADES

Regrades must be submitted within 2 business days *by email to Dr. Tyson* with a summary of what you want regraded (question number), and an explanation of why your answer is correct. *Please note that when you submit something for a regrade the entire assignment is subject to regrading. If a grading mistake is discovered that results in you receiving too many points, your grade could be lowered*.

QUIZZES (ungraded)

Within each lesson, there are quizzes that allow you to explore the material covered in the previous page. Though the page indicated that this is a "quiz," please note that these are ungraded and are used to practice solving problems. At the end of each quiz, there is a set of directions to help you move forward after answering the problems. After submitting a quiz, you will be able to review your responses and will be notified if a problem was answered incorrectly. We recommend that you take the time to review material and answer the question again to help you learn the material. If you are struggling to understand the answer to a problem, remember to ask questions. The instructor might be able to address it during the live lecture.

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 canvas or distributed by email. You must check the canvas and your *mail.gatech.edu* account daily. Note: There are potential problems associated with automatic forwarding of messages from *GT email* to other email addresses; check your *email* account even if you have it set up to forward email elsewhere.

WORKING IN GROUPS

Most learning takes place *outside* of the classroom. Although lectures should put things in perspective, studying additional materials such as the textbook and online resources, and solving the problems is when you will come to terms with the material. I encourage you to work together on reading and problem assignments. Although you might study in groups, remember that you are responsible for your learning. Everybody can benefit from teamwork. If you are struggling with the material you stand to learn a lot; if you are an "Organic Whiz" you also stand to learn from the challenge of presenting your understanding to others. You will learn through teaching.

COMPETITION AND GRADING

Formal education often puts students in competition with each other for good grades. We do not believe that competition for grades, and the exclusion of everything else, is the most effective way to foster student development. Although grades will be assigned based on a numerical score which judges attainment on exams, The course is structured such that if you show a desire to learn, put *the effort in, and have some intellectual ability, you can get the grade you want. Please take the time to read the Grades, Expectations and Minimum Requirements section, and decide what you want from the course.*

CANCELLATION OF CLASSES

If class is cancelled, a make-up lecture and any change in assignment deadlines will be announced.

TIME COMMITMENTS

For each one hour of lecture, you should aim to put in *at least* another two hours of your own time. You will need to spend more time preparing for exams. Some students will require more, some less.

GRADES, EXPECTATIONS AND MINIMUM REQUIREMENTS

(adapted from J. H. Williams in *The Teaching Professor*, Aug 1993)

"D" -60%- Some demonstration of detailed knowledge of organic reactions.

“C” -70%- Detailed knowledge of structure and bonding, be able to show movement of electrons

during reactions, know individual organic reactions.

“B” -80%- Requirements for a “C”, plus some demonstrated success of multistep synthesis of

molecules, some success showing movement of electrons for multistep reactions.

“A” -90%- Requirements for a “B”, plus: write consistently good complete pathways for

multistep reactions based on simple mechanistic concepts showing flow of electrons in each

step. Propose good syntheses for molecules using a string of individual organic reactions.

““A” students have almost perfect performance. Their commitment to the class

resembles that of the teacher. They always read the assignment, and their attention to

detail is such that they occasionally catch the teacher’s mistakes (we all make them!). An

“A” student is CREATIVE, COMMITTED, ORGANIZED, and CURIOUS, has a RETENTIVE MIND (and exercises it), has a WINNING ATTITUDE, and SHOWS INITIATIVE.”

If every student gets 90+%, everyone gets an “A”

SOME STUDY TIPS

Understand and *Rationalize*. Read the text and online resources, prepare your own summaries. Typically, each section in the text can be generalized in one or two lines or equations. Read the chapter summaries. Do you understand each point? Can you apply each concept? Work as many of the problems in the book or online as possible. If you have no trouble with the first few parts of a multi-part question, you might want to pick a few of the latter parts at random. Study in groups.

Keep up to date! Ask Questions!!

ACADEMIC INTEGRITY

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech’s Honor Code and the student Code of Conduct. Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student

Integrity, who will investigate the incident and identify the appropriate penalty for violations.

STUDENTS WITH LEARNING NEEDS AND SPECIAL ACCOMMODATIONS

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain a letter of accommodation. Please also email me as soon as possible to set up a time to discuss your learning needs.

STUDENT-FACULTY EXPECTATIONS AGREEMENT

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

ACADEMIC SUPPORT WHILE ABROAD

Given the typically small class sizes associated with study abroad programs, students are encouraged to seek academic assistance from their instructors or teaching assistants during scheduled office hours or by arranging individual appointments, as needed. In addition, students may access free tutoring services through Georgia Tech Knack (see success.gatech.edu/tutoring for more information). Students are also expected to notify the instructor and/or program director promptly if circumstances arise that may adversely affect their academic performance.