## CHEM 6370 Syllabus

Introduction to Organic Reaction Mechanisms, CHEM 6370, 3 Credits

Fall 2026

## Instructor Information

**Instructor: Christoph J. Fahrni**

**Email: fahrni@chemistry.gatech.edu**

## General Course Information

### Description

This course introduces organic reaction mechanism with an emphasis on proposing reasonable mechanisms based on the arrow-pushing technique. Using basic physical organic chemistry concepts, we will rationalize the outcome of complex organic transformations and propose reasonable reaction mechanisms through stepwise interconversion of reactive intermediates. In the first part of the course, we will focus on key concepts of physical organic chemistry, including structure and models of bonding, strain and stability of organic molecules, acid-base equilibria, and stereochemistry. In the second part of the course, we will employ these concepts to propose reasonable reaction mechanisms for rationalizing the outcome of complex organic transformation.

### Course Learning Outcomes

Students who complete this course successfully will be able to:

- Describe the structure and bonding of organic molecules using valence bond theory and qualitative molecular theory
- Estimate the relative thermodynamic stability of reactive intermediates
- Predict and rationalize acid-base strength and equilibria in aqueous and non-aqueous systems
- Describe and predict stereoisomers in organic transformations
- Propose reasonable reaction mechanisms of complex organic transformations based on the stepwise interconversion of reactive intermediates using the arrow-pushing technique

**Required Course Materials**

- "The Art of Writing Reasonable Organic Reaction Mechanisms", Robert B. Grossman, 2nd ed, Springer Science, 2003.
- "Modern Physical Organic Chemistry", by Eric V. Anslyn and Dennis A. Dougherty, University Science Books, 2006.

**Grading Policy:**

The grade will be assigned based on the average of highest three (out of four) in-class exams (50% weight), the average of the take-home problem sets (20% weight), and the final exam (30% weight).

The final grade will be assigned as a letter grade according to the following scale:

A 85.0 – 100%
B 72.0 – 84.9%
C 60.0 – 71.9%
D 50.0 – 59.9%
F Less than 50.0%

**Description of Graded Components**

All exams are in class and closed book and notes.

## Course Policies

**Attendance and/or Participation**

Students are expected to attend at least 90% of the course sessions. Furthermore, active participation, including participation in discussions is expected. Excused absences: Students are responsible for contacting the instructor prior to the missed class session. Valid reasons for missing a class session are limited to emergencies (illness), official Georgia Tech business, and job interviews. Student must provide official documentation for all excused absences.

**Academic Integrity**

Students are expected to maintain the highest standards of academic integrity. All work submitted must be original and properly cited. Plagiarism, cheating, or any form of academic dishonesty will result in immediate consequences as outlined in the university's academic honor code: https://policylibrary.gatech.edu/student-life/academic-honor-code

**Accommodations for Students with Disabilities**

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 an accommodations letter. Please also e-mail me as soon as possible in order 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.

## Campus Resources for Students

The Undergraduate Research Opportunities Program (UROP) provides resources and support for undergraduate research students and their mentors. Visit https://undergradresearch.gatech.edu/ or contact UROP at urop@gatech.edu for more information.