

CHEM 154GS – Mechanisms of Organic Reactions Syllabus

Course description

This course will offer a qualitative approach to the mechanisms of various organic reactions: substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry.

We will cover a large portion of the book “The Art of Writing Reasonable Organic Reaction Mechanisms” by Robert Grossman (free pdf version will be made available to students but they are welcome to purchase their own physical copies if desired), including:

- Chapter 1 – the basics
- Chapter 2 – polar reactions under basic conditions
- Chapter 3 – polar reactions under acidic conditions
- Chapter 5 – free-radical reactions
- Chapter 6 – transition metal-mediated and -catalyzed reactions

CHEM 40AB or CHEM 41ABC are required prerequisites.

Examination and grading

Daily problem-solving participation – 5 points each class x 20 = 100 points total

Weekly problem sets – 10 points each x 5 = 50 points total

Final cumulative problem set – 50 points

Class total = 200 points

Guaranteed point cutoffs

≥170 points = A (+/- inclusive)

≥150 points = B (+/- inclusive)

≥130 points = C (+/- inclusive)

≥100 points = D

<100 points = F

Course letter grades will be an objective assessment of your individual performance, *i.e.* there are no predetermined number of A's, B's, or C's.

Daily problem-solving participation – 50% of course grade

During daily class time we will spend ~40% of our time collectively working through mechanism problem sets based on the daily lecture material. While these will be worked through collaboratively, each student will submit their own daily contribution efforts to demonstrate their active participation in these sessions. Each day's submission is worth 5 points and is graded for completion effort.

Weekly problem sets – 25% of course grade

Weekly problem sets will be given out on Thursdays with a focus on the week's reaction mechanisms and be due on Mondays. Students will complete these problem sets individually to demonstrate their individual mastery of the most recent topics. Each problem set is worth 10 points and will be graded for accuracy though partial credit will be awarded for demonstrated effort.

Final problem set – 25% of course grade

A cumulative problem set will be given during our final class meeting time which will be completed individually and scored for accuracy. 50 points possible graded for accuracy and demonstration of all concepts covered throughout the course.

Lecture structure

Each day of class will feature ~60% of time of traditional lecture on the mechanism topic. The remaining time will be active guided mechanism problem solving.

*Excursion/outing days are built into the schedule along with flexibility for overflow discussion and research

CHEM 154GS Course Schedule

MTWR 9:30am-11:15am

	Monday (M)	Tuesday (T)	Wednesday (W)	Thursday (R)
Week 1	Chapter 1	Chapter 1	Chapter 1	Chapter 2
Week 2	Chapter 2	Chapter 2	Chapter 2	<i>excursion</i>
Week 3	Chapter 3	Chapter 3	Chapter 3	Chapter 3
Week 4	Chapter 5	Chapter 5	Chapter 5	<i>excursion</i>
Week 5	Chapter 6	Chapter 6	Chapter 6	Final problem set