

Catalyst to the Success of a Chemistry Major

Department of Chemistry
Columbus State University
Columbus, Georgia

2024-2025 Key Dates and Resources



Types of Chemistry Careers: Career Choices

Polymer Chemistry
Chemical Engineering
Physical Chemistry
Pulp and Paper Chemistry
Materials Science
Medicinal Chemistry
Agricultural Chemistry
Consumer Product
Development Chemistry
Water Chemistry
Chemical Sales and
Marketing
Textile Chemistry
Colloid and Surface Science

Hazardous Waste
Management
Analytical Chemistry
Food and Flavor Chemistry
Inorganic Chemistry
Biotechnology
Geochemistry
Chemical Education
Organic Chemistry
Catalysis
Oil and Petroleum Chemistry
Biochemistry
Environmental Chemistry
Forensic Chemistry
Science Writing



Research Interests at CSU

- Main Divisions of Chemistry

- Organic Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Analytical Chemistry
- Industrial Chemistry
- Biochemistry

Food Science/
Environmental/Atmospheric

Catalysis Chemistry

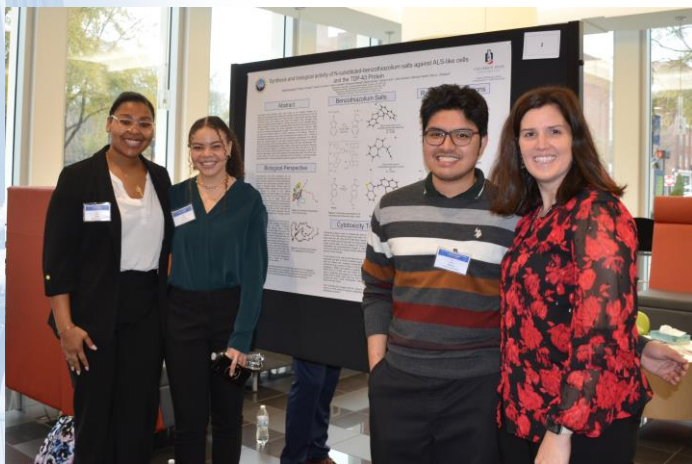
Electrochemistry

Polymer Chemistry

Medicinal Synthetic Chemistry

Inorganic Synthesis

Peptide & Biochemical Processes



Departmental Scholarships

- Outstanding Freshman Chemistry Award

Eligible students must have completed CHEM 1211/1211L (with a grade of C or higher) and be enrolled in CHEM 1212/1212L during Spring. This scholarship is selected by the department faculty and no application is necessary.

- [Fluorescence Series Junior Award Application](#)

- [Fluorescence Series Senior Award](#)

- [Refresco Chemistry Scholarship](#)



- Applications will be available during the Fall each year, winners will be announced in the Spring, and funds will be available the following academic year.

- \$1000 annual gift (\$500 each for Fall and Spring semesters). Any current Sophomore chemistry major that has completed Principles of Chemistry I and II with a grade of C or better and has cumulative GPA of 2.5 or higher is eligible to apply.



Departmental Scholarships

- [Momentum Scholarship](#)

\$1000 annual gift (\$500 each for Fall and Spring semesters). Incoming freshman chemistry major with a grade of C or better and has cumulative GPA of 2.75 or higher is eligible to apply.



Key Curriculum Dates

Item	Date
Schedule Change, Drop/Add (100% Refund)	August 12-16
Midterm Exams	September 27 - October 2
Advising for Spring 2025 semester	September 30 - October 18
Deadline to Withdraw with a WP (See <u>Withdrawal Dates</u> for short-terms)	October 11
Last Class Meeting Day	MWF - December 2 MW - December 2 TR - November 21 M only - December 2 T only - November 19 W only - November 20 R only - November 21 F only - November 22

Key Extracurricular Dates

Item	Date
Catalyst Talk – Howard Hall 218	August 30
SRACE grants due	September 13
Only permitted to submit one travel and fund application during academic year	
Midterm Exams	September 27-October 2
National Chemistry Week	October 21-25
SERMACS	October 23-26
Georgia Undergraduate Research Conference (GURC) 2024	November 8-9
SRACE grants due	February early
Only permitted to submit one travel and fund application during academic year	
Georgia Academy of Science	March 7-8
Tower Day 2025	April 25, 2025

[Student Travel Awards](#)

"COLS Dean's Office Fall 2024 Events"

Date	Time	Location	Room
Thursday, August 15, 2024	12:30 p.m. - 2:30 p.m.	COLS Dean's Office Open Office Hours (students only)	COLS Dean's Office
Tuesday, August 20, 2024	12:30 p.m. - 1:20 p.m.	How to Study - STEM students	Arnold Hall 111
Thursday, August 29, 2024	12:30 p.m. - 1:20 p.m.	How to Study - Humanities/Social Sciences students	Stanley Hall 209B
Tuesday, September 3, 2024	12:30 p.m. - 1:20 p.m.	How to Study - STEM students	Arnold Hall 111
Tuesday, September 17, 2024	12:30 p.m. - 1:20 p.m.	How to Study - Humanities/Social Sciences students	Stanley Hall 209B
Thursday, October 31, 2024	9:00 a.m. - 5:00 p.m.	COLS Dean's Office Halloween Open House	COLS Dean's Office
Monday, November 11, 2024	1:00 p.m. - 3:00 p.m.	COLS Dean's Office Open Office Hours (students only)	COLS Dean's Office
Thursday, November 21, 2024	12:30 p.m. - 1:20 p.m.	Thankful Thursday	

Career Readiness Opportunities

CHEM 1715 Speaker*	Date
Resume/CV workshop by CSU Career Service	September 13
Scientific Writing/Library Services	October 11
CWW South Plant Speaker	October 18
Pratt & Whitney – Miles Simmons & Kyle Switzer	November 8
Refresco – Michelle McGuire	November 15

Item/Speaker	Date	Room
Refresco - Suzanne Carney	September 19	Stanley 209B
Professional Portfolio Drop-in Workshop with Dr. Taylor	October 24	Jordan 335
EPA - Alexis Alvarez	October 31	Stanley 209B

*Contact [Dr. Kerri Taylor](#), if you are interested in any of the listed events

Resources

1. [CSU Chemistry](#)
 2. [CSU Professional Portfolio Review](#)
 3. [Academic Center of Tutoring](#): The ACT has tutoring available online and face to face with CSU affiliated tutors.
 - All tutoring will be by appointment. See the [appointment page](#) to make an appointment. You can make your own appointments through the Accudemia system at least one day in advance.
 - Lap top rental :The CSU library will have laptops available to check out for use taking online classes as well as for participating in online tutoring. Contact the library for more information ([706-507-8670](tel:706-507-8670)).
 4. [Louis Stokes Alliances for Minority Participation](#)
 5. [Center for Career Design](#)
 6. [Center of Online Learning](#)
 7. [Simon Schwob Memorial Library](#)
 8. [CSU Advising](#)
 9. [Registrar](#)
- Registrar – 706-507-8834
 - UITS Help Desk – 706-507-8199
 - University Police: 706-568-2022 or 706-507-8911
 - Campus Services – 706-507-8203
 - Academic Center Tutoring – 706-507-8646
 - Library – 706-507-8670
 - COOL – 706-507-8699; After Hours -
 - COLS Dean's Office – 706-568-2056
 - Dean of Students – 706-507-8730
 - OSP – 706- 569-4147
 - LSAMP – 706-568-2067
 - Career Services – 706-507-8525

Faculty

- Dr. Abegaz, abegaz_samuel@columbusstate.edu
- Dr. Banerjee, banerjee_anil@columbusstate.edu
- Dr. Dabke, dabke_rajeev@columbusstate.edu
- Dr. Gebehyhu, gebeyehu_zewdu@columbusstate.edu
- Ms. Gonzalez, gonzalez_jaimie@columbusstate.edu
- Dr. Holley, holley_daniel@columbusstate.edu
- Dr. Felix, felix_ansley@columbusstate.edu
- Dr. Jackson, jackson_floyd@columbusstate.edu
- Dr. Meyers, meyers_jonathan@columbusstate.edu
- Dr. Taylor, taylor_kerri1@columbusstate.edu



Why get involved in Undergraduate Research

- **Grow Academically:**
 - Gain in-depth knowledge and understanding of the topic you investigate.
 - Be challenged, stretched, made to think in new ways.
 - Take advantage of learning opportunities available at CSU.
 - Become a part of the intellectual life of the University (present work at a professional conference or be a co-author on a publication).
 - Help your faculty mentor advance knowledge in his or her field.
- **Grow Professionally:**
 - Hone skills in oral and written communication, teamwork, and problem solving, for example.
 - Clarify your career goals (even if only to decide that research is not for you).
 - Increase your chances of getting into graduate school, medical school, or whatever school if you highlight your research experience when you apply. (In many doctoral programs especially, programs expect applicants to have research experience.)



Undergraduate Chemistry Student Activities

- American Chemical Society Student Chapter (ACS)
 - ACS is a congressionally chartered independent membership organization which represents professionals at all degree levels and in all fields of chemistry and sciences that involve chemistry. We are dynamic and visionary, committed to “Improving people’s lives through the transforming power of chemistry.”
- Any Chemistry major can join
- Activities range throughout the year
 - Lab Crawl
 - National Chemistry Week
 - Chemistry Demos
 - Service Outreach
 - ACS Conferences



Study Tips for CHEM 3111/3112

- Forget memorization, use study tactics.** It won't help you now. The only things you should be memorizing are common names for benzenes with substituents, and ochem 1/gen chem stuff. Do not try to memorize the reagents back and forth.
 - Notecards, games, etc.
 - Email Dr. Taylor for student made handouts from CHEM 1152, 3111, 3112
 - Utilize key websites for aids
- Classify reagents by what they do!** Are they ortho directors? Do they add markovnikov or anti? Will this turn an aldehyde into a carboxylic acid? Does this perform addition to the most or least substituted carbon? Classify them **HOWEVER** makes most sense to you and look for patterns. If you can't find any among some, find a new classification they fit in.
- Dr. Taylor has a huge handout that can get you started.

MAKING CHEMICAL REACTIONS HAPPEN FASTER

There are a number of different things that we can change to make a chemical reaction faster. Here, we explain the concept of collision theory, and how it can be used to explain the effects of five different factors on the rate of a chemical reaction.

COLLISION THEORY

Collision theory states that, for a reaction to occur, particles must collide with the correct orientation and with sufficient energy for a reaction to occur. Different factors affect the rate of the reaction by affecting the frequency of particle collisions, and/or the proportion of collisions that have enough energy to react.

INCREASE CONCENTRATION OF REACTANTS

Increasing the concentration of reactants in solution increases the rate of reaction as there are a greater number of particles available to react. This increases the frequency of collisions between particles.

INCREASE TEMPERATURE OF REACTION

Increasing the temperature increases the kinetic energy of particles. This increases the frequency of particle collisions, and a greater proportion of collisions will have the energy required to react.

INCREASE SURFACE AREA OF REACTANTS

Increasing the surface area of solid reactants increases the number of particles that are exposed and available to react, and as a consequence this increases the frequency of particle collisions, increasing rate.

INCREASE PRESSURE OF REACTION

Increasing the pressure of a reaction involving gases forces the gas particles closer together. This will increase the frequency of particle collisions, and therefore increase the rate of reaction.

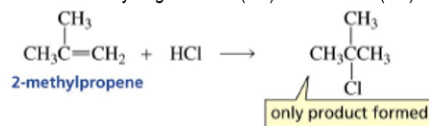
USE A CATALYST IN THE REACTION

A catalyst provides an alternative route for the reaction, with a lower activation energy. This means that particle collisions need less energy in order for a reaction to occur, increasing the rate of the reaction.

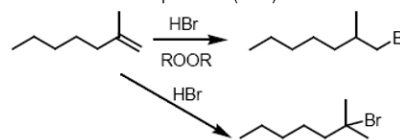
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4. Synthesis of Alkyl Halides

a. Addition of hydrogen halide (HX) to an alkene (4.1)

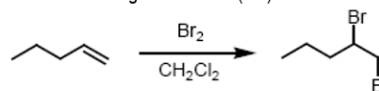


b. Addition of HBr + peroxide (4.10)



-in the presence of peroxide, ANTI-MARKOVNIKOV product is formed
-UV light causes same effect as peroxide

c. Addition of halogen to alkene (4.7)

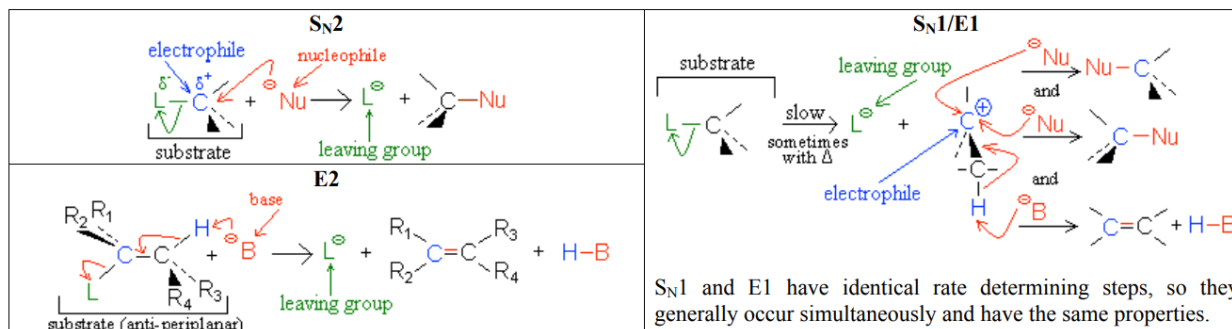


-in a non-nucleophilic solvent, a VICINAL dihalide is produced
-rearrangements are less common here

Study Tips for CHEM 3111/3112

- **Track reactions.** Mark where the nucleophile is at the beginning, and where it is at the end. same for electrophiles. **TRACK CHARGES.** Understand every part of the reaction. Don't make a single change in a molecule without knowing why it happens.

<https://leah4sci.com/how-to-tackle-organic-chemistry-synthesis-questions/>



	S _N 2 and E2	S _N 1/E1
mechanism	one step—this single step is the rate-determining step (RDS)	two steps—RDS is formation of carbocation
big obstacle	S _N 2: steric hindrance blocking Nu (Nu is in RDS) E2: blocking B isn't a big obstacle (B doesn't join substrate)	stabilizing carbocation (Nu/B isn't in RDS, so blocking it isn't an obstacle)
stereo-chemistry	S _N 2: inversion (backside attack, since LG blocks frontside) E2: cis vs. trans determined by anti-periplanar transition-state	S _N 1: racemization (planar carbocation intermediate) E1: both cis and trans isomers will be produced

- **Whiteboards/Google Jamboard.** Use whiteboards to mark these things in different colors over and over and over.

Study Tips for CHEM 3111/3112

- **Utilize models and active practice models.** Model kit: Highly useful...look at Walmart, Amazon, Dalton Labs or Darling Lab. <https://www.darlingmodels.com/kit-1-isbn-978-09648837-1-0-plastic-box-organic-inorg>
Another option is an online virtual kit, which can be found at the following address:
<https://chemagic.org/molecules/amini.html>
- **Practice problems.** Use local links and google search engine to gain more access to practice problems.
[Library for Organic Chemistry Active Learning \(LOCAL\) \(chemistryconnected.com\)](http://chemistryconnected.com)



Success Tips for STEM

- **Reach out to professor.** Use the bookings to access your professors The link to my office hours is in my email and CV.
- **Plan routine advising.** Use Accudemia to schedule an appointment.
- **Prep for the final exam throughout the semester.** Do everything your professor gives you. Have an MCAT prep book? Do all the ones in there. Look them up online. Taking the acs final? [ACS Exams Institute](#)

