CHEN 1203 General Chemistry for Engineers 2

Spring 2025, 2 Credit Hours

MW 8:30am-9:20am Jennie Smoly Caruthers Biotec A115

2025-01-13 through 2025-05-01

Instructor

Dr. Katie O'Harra

katie.oharra@colorado.edu

Office: JSCBB BIOT D1B18

Dr. O'Harra's Office Hours: Wednesdays, 1:00 pm - 2:00pm, BIOT D1B18

When emailing Dr. O'Harra, please include "CHEN 1203" in email subject line.

Teaching and Course Assistants

Graduate Teaching Assistants:

Carly Williams, carly.williams-1@colorado.edu

Course Assistants (CAs):

Teia Lita, teia.lita@colorado.edu

Nicole Lollini, nicole.lollini@colorado.edu

Rebecca Rhodes, rebecca.rhodes@colorado.edu

(See Canvas for Additional Help Sessions with CAs and GTA)

Course Description

Designed for students whose academic plans require advanced work in chemistry. Topics include kinetics, solubility/solubility equilibria, acid-bases, buffers and titrations, thermodynamics, and electrochemistry. Examples and problems illustrate the application of chemistry to engineering sub-disciplines. AP Chemistry credit not accepted in lieu of any of these prereq classes.

Registration Restrictions

Requires prerequisite courses of CHEN 1201 or CHEM 1113 or MCEN 1024 (all minimum grade C-). Restricted to College of Engineering undergraduates (ENGRU) and IUT On Track applicants only.

Textbook and Other Required Materials

Textbook: Nivaldo J. Tro, *Chemistry: A Molecular Approach,* 6th edition, Pearson, 2023.

Course Communication: Canvas will be used for assessment, shared lecture content, additional course resources, grades, and announcements. Note that the Pearson course materials are integrated with Canvas.

Course Summary

In-Person Lecture: MW 8:30am-9:20am Jennie Smoly Caruthers Biotec A115

Important Dates

Midterms 9/23, 10/21, 11/18 (during class period)

Final 12/16/24 7:30–10 p.m.

Outline of Topics/Content Modules

- Solutions
- Chemical Kinetics
- Chemical Equilibrium
- Acids and Bases, Ionic Equilibrium
- Free Energy and Thermodynamics
- Electrochemistry
- Organic Chemistry
- Biochemistry
- Non-Metals, Metallurgy
- Transition Metals, Coordination Compounds

Student Learning Outcomes

In this course, students will:

• Master basic mathematical skills and fundamental chemical concepts.
• Understand the connection between macroscopic observations, molecular views, and abstract or symbolic representations in chemistry.
• Recognize the relationship between molecular structure and chemical and
• physical properties, including the effects of temperature and pressure.
• Understand the basis of and effectively use the periodic table.
• Analyze complex chemical problems, develop critical thinking skills, and iteratively

integrate foundational knowledge with logical approaches to
problem solving.
• Draw and interpret graphs and analyze data in class, in recitation, and on exams.
• Recognize and explain how chemistry concepts apply to everyday phenomena.
• Take personal responsibility for learning and enhance self-regulated learning skills.
• Articulate an understanding of science and demonstrate communication skills.
• Develop an understanding of the following subsets of chemistry:

- Solutions
- Chemical Kinetics
- Chemical Equilibrium
- Acids and Bases
- Ionic Equilibrium
- Free Energy and Thermodynamics
- Electrochemistry
- Organic Chemistry
- Biochemistry
- Non-Metals, Metallurgy
- Transition Metals, Coordination Compounds

A detailed course outline will be posted to Canvas separately, including readings assigned for each class period, scheduled help sessions, and due dates.

Standard Grading Scale

90 / 93 / 100 %	A-, A
80 / 83 / 87 %	B-, B, B+
70 / 73 / 77 %	C-, C, C+
60 / 63 / 67%	D-, D, D+
< 60%	F

Grading Distribution

Homework 25%

Clicker Quizzes 20%

Midterm Exams 30%

Final Exam 20%

Note: The lowest 5-10% of homework and in-class activity grades will be dropped (exact # TBD).

Engaged Learning and Reflection Opportunities (Optional):

Students will have the opportunity to complete *optional* prompted reading reflection assignments for each chapter and "Everyday Chemistry" collaborative activities to earn additional or extra credit points toward various assessment categories. Up to 5 will be accepted for each category; these will be rather individualized and graded on a completion basis, if basic requirements are met. These "bonus" activities are incentivized in order to *'challenge students to develop your own knowledge, comprehension, and conceptual understanding by both reflecting and communication what you are learning'.*

Course Policies

- All assignments are due at 11:59pm on respective due dates and must be completed by this time. Without a formal extension/excuse (medical situation, emergency, etc. – contact Dr. O'Harra directly), late work will not be accepted.
- Unless otherwise noted, all work is to be submitted electronically on Canvas via Gradescope. The Pearson textbook and course materials are integrated with this platform.
- An exceedingly high standard of professional quality and clarity is expected on assignments. Understanding content and its applicability is elevated when you are also able to communicate this knowledge effectively.
- Exams may only be missed for valid medical reasons or official University business. Please give sufficient notice of any expected absences on exam days. Exams missed without a valid excuse are not subject to the above and will be recorded as zeroes.
- In-class course periods will include lecture and active learning opportunities. Students will actively engage with course content in class. Please bring a notebook or note-taking device to class daily. All electronic devices must run with the volume off during regular classes.
- Any type of calculator, laptop, tablet, etc. is allowed for use during class, but only a simple calculator is allowed for exams. Students are encouraged to use electronic tools to solve problems (see Honor Code)!
- Regular attendance is expected and highly encouraged due to the interactive and incentivized nature of our class meetings!

University Policies

Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation, or political philosophy.

For more information, see the classroom behavior policy, the Student Code of Conduct, and the Office of Institutional Equity and Compliance.

Requirements for Infectious Disease

Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all applicable campus policies and public health guidelines to reduce the risk of spreading infectious diseases. If public health conditions require, the university may also invoke related requirements for student conduct and disability accommodation that will apply to this class.

If you feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the guidance of the Centers for Disease Control and Prevention (CDC) for isolation and testing. If you have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home but should follow the guidance of the CDC for masking and testing.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website.

If you have a required medical isolation for which you require adjustment, please email Dr. O'Harra directly to alert her about your anticipated absence due to illness, injury, or medical isolation.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In

the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: honor@colorado.edu, 303-492-5550. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, reporting options, and support resources can be found on the OIEC website.

Please know that faculty and graduate instructors must inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support for a variety of concerns, visit the Don't Ignore It page.

Religious Accommodations

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner. In this class,

See the campus policy regarding religious observances for full details.

Mental Health and Wellness

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS) located in C4C or call (303) 492-2277, 24/7. Free and unlimited telehealth is also available through Academic Live Care. The Academic Live Care site also provides information about additional wellness services on campus that are available to students.