Principles of General Chemistry for Engineers

Last Updated: Tue, 12/16/2025

Course prefix: CHEM

Course number: 1310

Section: B

CRN (you may add up to five):
31408

Instructor First Name: Andrew

Instructor Last Name: Hill

Semester: Spring

Academic year: 2026

Course description:

This course is a survey of general chemistry that covers a wide array of topics with focus on applications in everyday life. Specific topics include atomic structure, bonding theory, stoichiometry, properties of solids, liquids and gases, chemical thermodynamics, chemical equilibrium, electrochemistry, and kinetics.

Course learning outcomes:

- *Identify* steps in the scientific method and apply them in a laboratory setting.
- *Apply* concepts of measurement and significant figures to laboratory practices and
- chemical problems.
- *Correlate* position on the periodic table to properties of elements and bonding.
- *Calculate* amounts of chemical species using information from chemical formulas and chemical equations.
- *Correlate* information from balanced chemical equations to the microscopic scale.
- *Explain* atomic structure using the quantum mechanical model of the atom.
- *Explain* periodic trends using theories of electronic structure.
- *Correlate* molecular structure to molecular properties and reactivity.
- *Interpret* thermochemical equations and data and evaluate energies of systems.
- *Summarize* the behaviors of gases and *explain* them using the kinetic-molecular theory.
- *Correlate* the molecular level process that occur during heating, cooling, and phase changes to the amount of energy removed or added to a system during each process.
- Interpret equilibrium data regarding gaseous and aqueous reactions.

- *Compare/contrast* the concepts of the three theories of acids and bases and apply them to inorganic and biological systems.
- *Integrate* the concepts of equilibrium, Gibbs free energy, and cell potential
- Use reaction mechanisms to *infer* the kinetics of a chemical reaction.
- *Compare/contrast* the relationships between rate and concentration, concentration and time, and rate and time. *Apply* these principles to kinetic data.

Required course materials:

Textbook

- *Interactive General Chemistry* by Macmillan Learning. This is an interactive e-book included with access to the online homework platform Macmillan Achieve (see below). Purchase access to the textbook and Achieve using the Macmillan Learning link on the lecture Canvas site.

Additional Materials

- Laboratory notebook (any full-size notebook is fine)
- *Microsoft Office suite.* You will need access to Word, Excel, and PowerPoint for this course. All can be downloaded free of charge for GT students through **OIT**.
- Access to Canvas, are required. If you experience connectivity issues, then please contact Dr. Le for assistance.

Grading policy:

Exam 1	10% or 100 points
Exam 2	10% or 100 points
Exam 3	10% or 100 points
Final Exam	22% or 220 points
Daily work[1]	25.5% or 255 points
Laboratory[2]	22.5% or 225 points
Total	**100% or 1000 points**

1. Daily work consists of online homework, group problem-solving in class, reflective surveys, and other assignments.
2. Students earning below 60% in the laboratory component OR below 60% in the lecture component of the course (exams 1-3, final exam, and daily work) of the course will receive an F for the semester and will be required to repeat both the lecture and the laboratory component, regardless of their final total points. Note that there is a separate laboratory syllabus.

Grading Scale

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

A	90.0 – 100%	900—1000 points
B	80.0 – 89.9%	800—900 points
C	70.0 – 79.9%	700—800 points
D	60.0 – 69.9%	600—700 points
F	Less than 60.0%	less than 600 points

OR Less than a 60% in laboratory or less than 60% of lecture components (less than 480 points of 800 points)

To encourage mastery of concepts and skills the course will not be curved.

Attendance policy:

Comprehensive guidelines regarding class attendance and excused absences can be found in the Georgia Tech catalog. Please read through the policies in their entirety.

http://www.catalog.gatech.edu/rules/4/

http://www.catalog.gatech.edu/policies/student-absence-regulations/

Academic honesty/integrity statement:

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. For information on Georgia Tech's Academic Honor Code, please visit: **http://www.catalog.gatech.edu/policies/honor-code/** or **http://www.catalog.gatech.edu/rules/18/**. Any student suspected of cheating or plagiarizing 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. During anytime throughout the semester you have question involving the Academic Honor Code, please contact your instructor or a first-year program faculty member.

Collaboration & Group Work

You are encouraged to work with classmates on in-class problem solving and to study with others outside of class. Collaboration on homework assignments is acceptable, and you should keep in mind that the effort you put into these assignments will be reflected in what you gain from them. Discussion of the material in laboratory assignments is appropriate; however, all work submitted in reports must be prepared independently.

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. See **http://www.catalog.gatech.edu/rules/22/** for an articulation of some basic expectation 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, we encourage you to remain committed to the ideals of Georgia Tech while in this class.

We expect students to arrive prepared for class, to participate in class activities and discussions, and to utilize office hours for additional help when needed.

In return, students should expect instructors to arrive prepared for class, to engage them in activities and discussions that further their understanding of course material, and to be available during office hours.

Students should expect to spend 6-9 hours per week outside of the classroom and laboratory to excel in this course. This includes time spent reading the textbook, watching videos as assigned, working problems, and writing laboratory reports. Students are encouraged to develop a pattern of preparing for class, attending class, and then reviewing after each class period.

Core IMPACTS statement(s) (if applicable):

This is a Core IMPACTS course that is part of the STEM area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help master course content, and support students' broad academic and career goals.

This course should direct students toward a broad Orienting Question:

- How do I ask scientific questions or use data, mathematics, or technology to understand the universe?