

CHEM 1310 Syllabus

Fall 2018

CHEM 1310, Section A (4 credit hours)

Lecture: MWF 10:10–11:00am, Clough 144

**Laboratory: Once weekly, various times (2 hours and 40 minutes),
Clough 5th floor**

Recitation: Once weekly, various times (50 minutes), various locations

General Information

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.

Pre- &/or Co-Requisites

There are no pre-requisites for this course. Some familiarity with subatomic particles, ions, chemical nomenclature, and basic stoichiometry are helpful but not required.

Course Goals and 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.

Course Requirements & Grading

Exam 1	15% or 150points
Exam 2	15% or 150 points
Exam 3	15% or 150 points
Final Exam	25.0% or 250 points
MasteringChemistry, In Class Work, Recitation and Exam Wrappers	10.0% or 100 points
<u>Laboratory¹</u>	<u>20.0% or 200 points</u>
Total	100% or 1000 points

¹Students earning below 60% in the laboratory component of the course will receive an F for the semester and will be required to repeat both the lecture and the laboratory component.

Grade Dispute Policies

Re-grades of midterm exams must be requested within one week of the date that the graded exams are returned to students.

Missing homework and TurningPoint (clicker) scores must be addressed, via email to carrie.shepler@chemistry.gatech.edu) within one week of the first date that scores are posted to Canvas. Announcements will be posted to Canvas when scores are posted.

Please refer to the laboratory syllabus for information regarding requests of regrades for lab reports and quizzes.

Description of Graded Components

Exams

Three closed-book exams will be given during the semester on the dates listed below and in the lecture schedule.

Exams contain multiple choice only, and no partial credit is awarded. Scantron cards will be provided.

Exam content (in terms of textbook chapters and lecture slide numbers) will be outlined via a Canvas announcement approximately one week prior to each exam. A list of applicable practice exam questions also will be provided. We do *not* provide explicit study guides or topic lists, so you should make notes in class and as you study about topics you feel are most important.

One 8.5 x 11" crib sheet will be permitted for use on each of the three intermediate exams. Only one side of the crib sheet may be used, and ***they must be in your own hand-writing. No photocopied material is permitted.*** The inclusion of photocopied or material in another's hand-writing will be considered academic integrity violations.

Final Exam

A two hour and fifty minute, multiple choice final exam will be given at the time and place determined for this course by standard Georgia Tech procedures. The exam will consist of approximately 60 multiple choice questions, and no partial credit will be given. Scantron cards will be provided. The final exam is scheduled for **Wednesday, December 12th from 8:00–10:50am**. The complete schedule of final exams may be found: <https://registrar.gatech.edu/current-students/exams>

Four crib sheets may be used for the final exam. These may be 8.5 x 11" in size with writing on only one side. **They must be in your own hand-writing. No photocopied material is permitted. All of your crib sheets will be collected with your final exam. You may not use photocopies of your crib sheets. You may not take pictures of your crib sheets after you have completed the final exam.**

Grade Improvement Plan

The final exam will be composed of four sections with the first three sections representing material from exams 1 – 3, respectively. The remaining section will cover material after exam 3. If you earn a higher score on a given section than you did on the corresponding exam, that percentage will replace the original score. For example, if a student earns a 75% on exam 1 and a 95% on section 1 of the final exam, the 95% will be used in the grade calculation. It is possible for all three original exam scores to be replaced with the Grade Improvement Plan. **You must have attempted the original individual exam or have an excused absence communicated to the course instructors to be eligible for the Grade Improvement Plan.**

MasteringChemistry, In Class Group Work, Recitation and Exam Wrappers

MasteringChemistry, in class group work, exam wrappers, and recitation comprise a total of 10% (100 points) of your overall course grade. **You need 130 points to earn the full 10%** and you may accumulate these points through various combinations of the four categories.

Assignment Type	Number of Assignments	Points per Assignments	Total Points Available from Assignment Type
MasteringChemistry	15	10	150
In Class Group Work	TBD	TBD	30 (adjusted)
Recitation	14	2, 1, 0	28
Exam Wrappers	3	5	15
TOTAL POINTS POSSIBLE			223

- *MasteringChemistry*: There are 14 assignments valued at 10 points each for a total of 100 possible points. Each assignment has a due date. You have three attempts at each question, and you are penalized for wrong answers only on multiple choice questions. You are NOT penalized for using hints. Individual extensions will be awarded only in cases of excused absences or disabilities accommodations, and both must be discussed with Dr. Shepler.
- *In Class Group Work*: Each clicker question asked in class is valued at 1 point for any answer and 2 points for a correct answer. There are no make-up opportunities. At the end of the semester, the points earned will be normalized to 30. For example:
If a total of 50 clicker questions are offered over the course of the semester, then there are 100 possible points. If you earn 75 of these points, you have $75/100 = 0.75$ of the points possible. $0.75 \times 30 = 22.5$, and you have earned 22.5 points available in daily work.
- *Recitation*: Attendance **and participation** in recitation is worth 2 points per sessions.
 2 points = attendance for the full session with participation
 1 point = attendance with limited participation
- *Exam Wrappers*: After each exam, an Exam Wrapper assignment will be posted on Canvas after your exams are returned. These assignments are due the Friday after your exams are returned.

Laboratory

You **must** pass Laboratory to pass the **overall course**. Teaching assistants will have the responsibility for establishing laboratory grades. Students are graded on pre-lab quizzes, formal lab reports, summary reports, report accuracy, lab technique and safety and two laboratory quizzes/practicums. **A grade of 60% or better in the lab is considered passing.** If you fail CHEM 1310 lab, you must retake the entire lecture and lab. Your teaching assistant may specify that students work in pairs or in larger groups for certain experiments. Whether this is the case or not, *all reports must be prepared independently by each student.* Please see the lab syllabus for more details.

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	

Course Materials

Course Text

Principles of Chemistry, the 3rd edition by Nivaldo J. Tro
Available in hardcopy and as an ebook

Additional Materials/Resources

- MasteringChemistry Access Code
- CHEM 1310 Laboratory Manual, 2018-2019 edition, with LateNite Labs access code (available only at the GT Barnes & Noble)
- Turning Point ResponseWare
- 100% cotton lab coat
- Composition notebook for use in laboratory

Course Website and Other Classroom Management Tools

Canvas

There are Canvas sites for both lecture and lab. All lecture materials, information, and grades (with the exception of those associated with recitation) are on the lecture site while all laboratory materials, information and grades are on the lab site. Be sure to select a deliver method for course announcements. ***You are responsible for all information posted in Canvas announcements.***

Piazza

This term we will be using Piazza for class discussion. The system is highly catered to getting you help quickly and efficiently from classmates, the TA, and professors (I will respond to Piazza posts once daily during the work week). We encourage you to post your questions on Piazza. Please keep in mind general guidelines for civility as you post questions and responses. We intend the site to help build community within the class and are determined for it be a safe and inclusive space for all students in the course.

You can access Piazza easily from the 1310 Canvas sites. If you have any problems, email team@piazza.com.

MasteringChemistry

Post-Lecture homework problems can be accessed directly via the following address:
<http://www.pearsonmylabandmastering.com>

Course Expectations & Guidelines

Academic Integrity

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/>
<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 freshman program faculty member.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please inform Dr. Carrie Shepler (carrie.shepler@chemistry.gatech.edu, Clough 584A) and Dr. Michael Evans (michael.evans@chemistry.gatech.edu) **within the first week of the course or as soon as possible.**

Attendance and/or Participation

The only components of CHEM 1310 with required attendance are laboratories and exams. Attendance in lecture and recitation is *strongly* encouraged, and points toward your course grade can be earned through attendance.

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 reports is appropriate; however, all work submitted in reports must be prepared independently.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

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/>

Guideline summary (***application primarily to exams and laboratories in CHEM 1310***):
You are permitted to miss an exam for Institute approved absences (athletics, etc.) You

should inform Dr. Shepler (carrie.shepler@chemistry.gatech.edu) as soon as you have your travel schedule so that we can make arrangements for you to take the exam at an alternate time.

If you miss an exam due to illness, then you should submit medical documentation to the Office of the Dean of Students. They will contact the course instructors, and we will work with you to determine the best course of action. Please also email Dr. Shepler (carrie.shepler@chemistry.gatech.edu) as soon as you know you will miss or have missed an exam due to illness. You do not need to provide details regarding the illness.

Students may miss exams due to personal emergencies. Again, documentation of some sort should be provided to the Office of the Dean of Students who will communicate with course instructors. Please also email Dr. Shepler (carrie.shepler@chemistry.gatech.edu) as soon as you know you will miss or have missed an exam due to personal emergency.

Students who are absent because of participation in a particular religious observance will be permitted to make up the work missed during their absence with no late penalty, provided the student informs the course instructors of the upcoming absence, in writing, within the first two weeks of class, and provided that the student makes up the missed material within the time frame established by the course instructors. This also applies to exams.

You must contact Dr. Shepler (carrie.shepler@chemistry.gatech.edu) immediately if you miss an exam without an excused absence (as outlined above), and you may not be permitted a make-up or replaced grade.

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.

Student Use of Mobile Devices in the Classroom

Laptop computers are not permitted in class because research indicates that material is better retained when notes are taken by hand and that laptops are a distraction to those around you. Permission may be obtained from Dr. Shepler to use a laptop in some circumstances. The use of tablets for note-taking is permitted.

Statement of Intent for Inclusivity

As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which you feel safe to participate in learning.

Campus Resources for Students

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support

- Center for Academic Success <http://success.gatech.edu>
 - 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring>
 - Peer-Led Undergraduate Study (PLUS) <http://success.gatech.edu/tutoring/plus>
 - Academic coaching <http://success.gatech.edu/coaching>
- Residence Life's Learning Assistance Program <https://housing.gatech.edu/learning-assistance-program>
 - Drop-in tutoring for many 1000 level courses
- OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support>)
 - Group study sessions and tutoring programs
- Communication Center (<http://www.communicationcenter.gatech.edu>)
 - Individualized help with writing and multimedia projects
- Academic advisors for your major <http://advising.gatech.edu/>

Personal Support

Georgia Tech Resources

- The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services>; **404-894-6367**; Smithgall Student Services Building 2nd floor
 - You also may request assistance at https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?
- Counseling Center: <http://counseling.gatech.edu>; **404-894-2575**; Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
 - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at **404-894-2204**.*
- Students' Temporary Assistance and Resources (STAR): <http://studentlife.gatech.edu/content/need-help>
 - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: <https://health.gatech.edu>; **404-894-1420**
 - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: <http://www.omed.gatech.edu>
- **Women's Resource Center:** <http://www.womenscenter.gatech.edu>; **404-385-0230**
- **LGBTQIA Resource Center:** <http://lgbtqia.gatech.edu/>; **404-385-2679**
- **Veteran's Resource Center:** <http://veterans.gatech.edu/>; **404-385-2067**
- **Georgia Tech Police:** **404-894-2500**

Course Schedule

Tentative Lecture Schedule

Week Of	Monday	Wednesday	Friday
August 20	Introduction	Atoms and Elements (2)	Atoms and Elements (2) Last day to register (4pm ET)
August 27	Molecules, Compounds, and Chemical Equations (3)	Molecules, Compounds, and Chemical Equations (3)	Chemical Quantities and Aqueous Reactions (4)
September 3	Labor Day Holiday	Chemical Quantities and Aqueous Reactions (4)	Gases (5)
September 10	Gases (5)	Thermochemistry (6)	Thermochemistry (6)
September 17	Thermochemistry (6)	In-class review for Exam 1 (Q&A; exam on Thursday)	Quantum-Mechanical Model of the Atom (7)
September 24	Quantum-Mechanical Model of the Atom (7)	Quantum-Mechanical Model of the Atom (7)	Quantum-Mechanical Model of the Atom (7)
October 1	Periodic Properties of the Elements (8) Progress reports due	Periodic Properties of the Elements (8)	Chemical Bonding I (9)
October 8	Fall Break	Chemical Bonding I (9)	Chemical Bonding I (9)
October 15	Chemical Bonding II (10)	In-class review for Exam 2 (Q&A; exam on Thursday)	Chemical Bonding II (10)
October 22	Chemical Bonding II (10)	Liquids, Solids, and Intermolecular Forces (11)	Liquids, Solids, and Intermolecular Forces (11) Withdrawal deadline (October 27, 4pm ET)
October 29	Liquids, Solids, and Intermolecular Forces (11)	Chemical Kinetics (13)	Chemical Kinetics (13)
November 5	Chemical Kinetics (13)	Chemical Equilibrium (14)	Chemical Equilibrium (14)
November 12	Acids and Bases (15)	In-class review for Exam 3 (Q&A; exam on Thursday)	Acids and Bases (15)
November 19	Free Energy and Thermodynamics (17)	Thanksgiving holiday	Thanksgiving holiday
November 26	Free Energy and Thermodynamics (17)	Free Energy and Thermodynamics (17)	Electrochemistry (18)
December 3	Electrochemistry (18)	Reading period	Final Exams
December 10	Final Exams	Final Exams	Final Exams

Schedule of Homework Assignments:

Homework Set	Chapter/Material Coverage	Parent Homework Deadline	Adaptive Follow-up Deadline
Intro	Intro to MasteringChemistry	Friday, August 31 (no points)	None
1	Chapters 1 & 2	Wednesday, August 29	Tuesday, September 4
2	Chapter 3	Wednesday, September 5	Monday, September 10
3	Chapter 4	Monday, September 10	Friday, September 14
4	Chapter 5	Thursday, September 13	Monday, September 17
5	Chapter 6	Monday, September 24	Thursday, September 27
6	Chapter 7	Wednesday, October 3	Friday, October 5
7	Chapter 8	Thursday, October 11	Monday, October 15
8	Chapter 9	Friday, October 19	Tuesday, October 23
9	Chapter 10	Friday, October 26	Tuesday, October 30
10	Chapter 11	Friday, November 2	Tuesday, November 6
11	Chapter 13	Friday, November 9	Tuesday, November 13
12	Chapter 14	Friday, November 16	Tuesday, November 20
13	Chapter 15	Tuesday, November 20	Tuesday, November 27
14	Chapter 17	Friday, November 30	Tuesday, December 4
15	Chapter 18	Tuesday, December 4	None

Homework Assessment:

1. Three (3) submissions will be allowed for each problem in the homework sets; you will receive 100% credit for a correct response on all three submissions except for multiple-choice problems. Homework is due at 8:00pm on the date indicated.
2. Each homework set is worth a total of 10 points. Seven of these points can be earned from the original homework set. If you earn a 95% or higher on the original homework set, you will automatically earn the remaining three points and will not be asked to complete the Follow-up homework set. If you do not earn a 95% on the original homework set you will be given a Follow-up homework set where you can earn the additional three points.

Exam Schedule

Exam 01	Thursday, September 20	6:00pm	Clough 144
Exam 02	Thursday, October 18	6:00pm	Clough 144
Exam 03	Thursday, November 15	6:00pm	Clough 144
Final Exam	Wednesday, December 12	8:00am	Clough 144