

CHEM 125: General Chemistry
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COURSE REQUIREMENTS

- **TEXTBOOK:** "Chemistry: A Molecular Approach" by Nivaldo J. Tro, 4th edition, Pearson. Student Partial Solution Manual is strongly recommended.

- **LECTURE:** Students are expected to go over the notes in Moodle and read the specified textbook material before coming to class.

- **RECITATION:** Students are expected to come to recitation prepared with notes, laptops and after having done the basic homework assignment. Each recitation, the students will be given a worksheet to solve based on the material seen in class. The worksheets are collected at the end of the recitation and graded. Students who did not succeed in completing the worksheet during the recitation have one week time to complete the worksheets during office hours. Students who miss a recitation for a valid reason must still make up the worksheet to get credit.

- **ATTENDANCE POLICY:** Attendance is required at all course meetings and is recorded using an iclicker. An iclicker and calculator are required for all lectures. If your iclicker malfunctions, you are required to inform the instructor in person at the beginning or end of the lecture. Failure to notify the instructor will result in loss of points for that day. All absences must be approved by the Dean of Students. Athletes who must miss a class due to a meeting must notify the instructor beforehand via email to avoid loss of credit. If you are in class, but caught listening to music, playing on your cell phone or disrupting the class, you will not get credit for that day's attendance and might be asked to leave the classroom. If you are cheating (having a second iclicker) you and the person for whom you are cheating will get 0 for attendance for the entire semester and will be reported to Dean of Students.

- **PARTICIPATION POINTS:** 190 points will be given for active participation in the class, divided between 70 points for iclicker questions during the lectures, 100 points for recitation worksheets and 20 points for a quiz on the final chapters at the end of the semester.

- **HOMEWORK:** All homework is located on the Moodle website. The homework assignments will be made available during the semester as we progress through the course. There are two types of homework: Basic and Regular.

Basic Homework, worth 100 points: Do the basic HW for the chapter before coming to the lecture. This homework is intended as a preparation for your participation in class. Getting > 70% in the basic homework before the lecture, will ensure you have the foundation necessary to understand what is being taught in class.

Regular homework, worth 160 points: This homework is to test your understanding of the material being taught. This homework will build on the classroom content and enhance your understanding of the material. This homework will also be good preparation for the common exams.

All homework is very important. However, it is absolutely important that you aim to get > 90% in the basic and >70% in the regular HW to help you pass this class. Each homework assignment has its due date. In addition, Moodle has a calendar with due dates. **All homework must be done on time, without exceptions.**

- **EXAMINATIONS:** There are 3 common exams and 1 final exam administered during the course. The exams are worth 550 points. You are required to maintain an average of 35% which is 193 points in the common exams and finals in order to have a chance to pass the course. An average of 34.9% (192 points out of 550) or less on exams guarantees an F, independent of your total final grade.
- **COMMON EXAMINATIONS:** Three common examinations will be administrated throughout the semester. Each Common exam is worth 100 points and is 75 minutes in duration. The timings of the common exams are posted on the registrar website and each student must ensure they are able to attend the common exam before enrolling into the class.
- **FINAL EXAM:** The final exam is a standardized ACS final. The exam is worth 250 points and is between 100 -110 minutes. Scoring > 50% in the final exam is a good target for a passing score in the course.

COURSE GRADING:

Common Exams #1, #2 and # total 300 points.

Final Exam is 250 points.

Basic Homework is worth 100 points.

Regular Homework is worth 160 points.

Class Participation is 190 points maximum, distributed between 70 for iclickers, 100 from recitations and 20 from a quiz at the end of the course.

The total maximum score is 1000 points. The minimum passing score changes each year; typically, it is around 600 points for a C and 860 points for an A. **You are required to maintain an average of 35% which is 193 points in the common exams and finals in order to pass the course.**

An estimated grading report will be made available after each exam.

- **EXAM BEHAVIOR:** Students are reminded that violations of the NJIT student Honor Code are serious and that the Chemistry Division will make an extraordinary effort to prevent CHEATING on all examinations and will vigorously prosecute cases of cheating, if any, in accordance with NJIT policy and procedures. Use the bathroom before or after test. No work is allowed on the test after leaving to use the bathroom. During sign in a NJIT photo ID or valid driver's license needs to be visible. No books, cell phones, notes, tables, or scrap paper will be allowed. Scientific Calculators but not hand held computers are permitted. Calculators with battery operation only are permitted. Students must bring two #2 pencils to all exams. If you have a medical condition, bring it to the instructor's attention at least one week in advance so special arrangements can be made.
- **MAKEUP EXAM POLICY:** One make-up examination will be permitted if there is an acceptable and substantial reason approved by the Dean of Students. A grade of zero will be given for a second missed examination independent of reason.

- **TEST GRADING ERROR.** Tests are returned in recitations following the test. If you believe there is an error, you have until the end of the day to submit a test for regrading. Once the answer key is released no tests will be accepted for regrading.

ALL ERRORS NEED TO BE BROUGHT TO THE INSTRUCTOR'S ATTENTION WHEN THEY OCCUR. DO NOT WAIT UNTIL THE END OF THE SEMESTER.

Tentative Course Schedule

Date	Chapter	Topic
Week 1	1	Matter, Measurement and Problem Solving
Week 2	2	Atoms and Elements
Week 3	3	Molecules, Compounds and Chemical Equations
09/25	EXAM 1	Chapters 1-3
Week 4	4	Chemical Quantities and Aqueous Reactions
Week 5	5	Gases
Week 6	6	Thermochemistry
Week 7	7	The Quantum-Mechanical Model of the Atom
10/23	EXAM 3	Chapters 4-6
Week 8	8	Periodic Properties of the Elements
Week 9	9	The Lewis Model
Week 10	10	Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory
Week 11	11	Liquids, Solids and Intermolecular Forces
11/20	EXAM 3	Chapters 7-10
Week 12	12	Solids and Modern Materials
Week 13	13	Solutions
Week 14		Review Session and Quiz on Chapters 11-13
Week 15		Review
12/??	Final Exam	Chapters 1-11

Learning outcomes

At the end of the 125 course, you will be able to

1. Explain atomic structure and write chemical formula for simple compounds
2. Perform chemical calculations systematically using dimensional analysis or multiplication by one
3. Calculate moles, molecular and empirical formula of a compound from basic principles

4. Balance chemical equations
5. Identify various types of chemical reactions and apply the concept of limiting reagent to calculate percentage yield of products
6. Apply various gas laws and the first law of thermodynamics to chemical problems
7. Calculate the energy changes in chemical reactions
8. Explain the quantum mechanical basis for the sub-structure of the atom
9. Write the electronic configuration for the elements in the periodic table
10. Draw the Lewis dot structures for simple molecules
11. Use VSEPR to predict shapes of molecules and whether a molecule will have a dipole moment
12. Identify sigma and pi bonds and explain the hybridization of the molecules
13. Describe the differences in bonding patterns between solids liquids and gases
14. Predict changes in freezing point, elevation in boiling point and osmotic pressure when a solute dissolves in a pure solvent