# CHEM 1135 - General Chemistry I (With Lab)

| 2022 Fall Session | |
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| **Total Class Sessions: 25** | **Instructor: Staff** |
| **Class Sessions Per Week: 5** | **Classroom: TBA** |
| **Total Weeks: 5** | **Office Hours: TBA** |
| **Class Session Length (Minutes): 145** | **Language: English** |
| **Credit Hours: 5** | **Total Laboratory Sessions: 10** |

## Course Description:

This course provides an introduction to the fundamental principles of chemistry, including substantial illustrative material drawn from the chemistry of inorganic, organic, and biochemical systems. The emphasis is placed on the basic concepts and factual material. Topics covered include: atoms and molecules; periodicity, bonding and molecular structure; intermolecular forces; thermochemistry, properties of solids; liquids, gases and solutions; stoichiometry and introduction to reactions in aqueous solutions. This course includes lab exercises.

## Course Materials:

***Textbook:*** **Chemistry: A Molecular Approach**, Nivaldo J Tro, 5th edition.

## Course Format and Requirements:

Material involves taking time to think things through, develop the knowledge (or process) and practice this. It is also very helpful to test yourself on your knowledge development. Using the quiz or exam as a means to test if you have learned something could be too late to determine you still have a gap in knowledge. Remember, lecture is very important in seeing process and models and hearing concepts and their derivation and application BUT is not the beginning and end of learning. It would be unusual to learn something simply from sitting in lecture.

**Labs**

The goal of the labs is to provide a hands-on experience with General Chemistry material and to enhance abilities in scientific methodology, critical thinking, and communicating about General Chemistry. Attendance is mandatory. No make-up labs will be provided.

**Attendance**

Attendance is mandatory. More than three unexcused absences will result in an automatic reduction in your participation grade, for instance from A- to B+. Your active participation in the class is expected and constitutes part of your grade.

## Course Assignments and Assessment:

**Quizzes**

There will be 6 quizzes administered through the whole semester and the lowest one will be dropped. Quizzes will always be completed in the first ten minutes of class. There will be no make-up quizzes.

**Midterm Exam**

The material covered on each examination will include everything in the lecture. To be fair to all, questions about what will be covered on exams will be answered in class only. No such questions will be answered by telephone or e-mail. Students will have two non-cumulative in-class midterm exams.

The only legitimate excuses for missing your testing period are extenuating circumstances that are beyond your control. Examples of these circumstances are illness, death in the family, or car accidents on the way to take the test. Forgetting when to come take your exam or sleeping through your exam period is not legitimate excuses. Excuses must be accompanied with proper documentation. Students that miss an exam due to illness must bring documentation from a physician stating that they were seen in the physician's office and that they were too ill to attend classes on that date. If you miss your exam period because of extenuating circumstances, it is your responsibility to inform your instructor in a timely fashion. Your instructor will then discuss with you appropriate measures to remedy the situation.

Students who arrive late for the exam will be allowed to begin the exam at the time they arrive but will lose all of the time they are late on the exam.

**Final Exam**

The final will be cumulative to allow you to demonstrate the breadth of knowledge you've acquired throughout the semester. The final exam will be close-book. The final exam is worth 30% of the total final score. Note that the final will not be taken during the normal class times. Exact time and location for final will be announced in the last week of sessions.

**Labs Assignment**

Lab grading depends on in-class worksheets, participation, lab reports and the lab final exam or presentation. Specific due dates for projects and more detailed lab policies will be given in lab. Attendance at labs is mandatory. Students missing 3 or more labs, whether excused or unexcused, will receive an F grade for the course.

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| 5 Quizzes | 10% |
| Labs | 20% |
| Midterm Exam 1 | 20% |
| Midterm Exam 2 | 20% |
| Final Exam | 30% |
| **Total** | **100%** |

## Grading Scale (percentage):

| A+ | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- | F |
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| **98-100** | **93-97** | **90-92** | **88-89** | **83-87** | **80-82** | **78-79** | **73-77** | **70-72** | **68-69** | **63-67** | **60-62** | **<60** |

## Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Chengdu University of Technology's *Academic Conduct Code.* Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

## Special Needs or Assistance:

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.

## Course Schedule:

| Week | Topics | Activities |
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| 1. | Course syllabus + Overview<br>Metrics and Measurement<br>Chemical Nomenclature<br>Overview of Atoms and Elements:<br>Modern Atomic Theory and Law<br>Atomic Structure, Protons, Neutron, and Electrons , Periodic Law and the Periodic Table, Isotopes, Structure of Ions<br>Hess's Law, Electromagnetic Radiations<br>Atomic mass, Molar Mass | Homework Assignment<br>Quiz 1 |
| 2. | Atoms to Molecules<br>Chemical Bond General Concepts<br>Ionic Bonds, Metallic bonds and Covalent Bonds<br>Bond Energy and Length, Lattice Energies<br>VSEPR theory<br>Molecular Shape and Polarity<br>Valence bond theory | Homework Assignment<br>Quiz 2 &3<br>Midterm 1 |

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| 3. | Inter-molecular Forces<br>Chemical Energy<br>Matter and Energy<br>Law of Conservation<br>Introduction to Thermochemistry<br>Ideal Gas Law, Property of Gas<br>Phase Change, Gasses, Liquids and Solids<br>Phase Diagrams | Homework Assignment<br>Quiz 4<br>Midterm 2 |
| 4. | Property of Liquid, solid and solution<br>Chemical Equations and Stoichiometry<br>Solution Stoichiometry<br>Chemical Reactions<br>Limiting reactants<br>Precipitation reactions | Homework Assignment<br>Quiz 5<br>Midterm 3 |
| 5. | Oxidation-reductions Reactions<br>Acid-base reactions<br>Net ionic equations<br>Introduction to Nuclear Chemistry<br>Course summary | Homework Assignment<br>Quiz 6<br>Final exam |

**Lab Schedule:**

Lab 1: First meeting; Introduction of everyone; Go through schedule; Assignments of the semester; Safety and rules; Laboratory techniques; Measurements
Lab 2: Molecular Shape and Polarity
Lab 3: Metals
Lab 4: Phase changes 1; Freezing point; Boiling point
Lab 5: Phase changes 2; Mixture; Mixture of Gas; Density of Gas
Lab 6: Acid-base reactions;
Lab 7: Limiting reactants
Lab 8: Solution stoichiometry; Precipitation reactions
Lab 9: Molar mass of liquid; Molar mass of an unknown acid
Lab 10: Oxidation-reductions Reactions
**Lab Final Presentation**