



## CHEM 1110: General Chemistry I

2021 Winter Session	
<b>Total Class Sessions: 25</b> <b>Class Sessions Per Week: 6</b> <b>Total Weeks: 4</b> <b>Class Session Length (Minutes): 145</b> <b>Credit Hours: 4</b>	<b>Instructor: Staff</b> <b>Classroom: TBA</b> <b>Office Hours: TBA</b> <b>Language: English</b>

### Course Description:

General Chemistry Courses provide an introduction to the fundamental principles of chemistry. Topics include: atoms and molecules; periodicity, bonding and molecular structure; intermolecular forces; properties of solids; liquids, gases and solutions; stoichiometry and introduction to reactions in aqueous solutions; infrared spectroscopy, and mass spectrometry; thermochemistry and the first law of thermodynamics; quantum aspects of light and matter; and bonding in diatomic and polyatomic molecules. Laboratory exercises include: the size of an atom, qualitative analysis, thermochemistry, and quantum aspects of light and matter.

### Course Materials:

*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.

### Course Assignments:

#### **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 three 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.

Any questions regarding credit on an exam question must be submitted in writing within two days after the grades have been posted on Canvas. Any questions regarding exam credit will not be considered after two days.

### **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 40% 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.

### **Course Assessment:**

Quizzes (5 out of 6)	15%
Midterm Exam 1	15%
Midterm Exam 2	15%
Midterm Exam 3	15%
Final Exam	40%
<b>Total</b>	<b>100%</b>

### **Grading Scale (percentage):**

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
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:**

Class 1:

Introduction to the course;  
Go through the syllabus;  
World of Chemistry  
Measurement and Problem Solving methodology;

Class 2:

Common metrics  
Atoms and Elements:  
Atoms, ions, electrons, neutrons, protons, atomic mass

Class 3:

Atoms and Elements:  
Hess's Law;  
Electromagnetic radiation;

Class 4:

Quiz 1  
Atoms and Elements:  
Wave-particle duality;  
Atomic spectra  
Atom Structure and Periodicity:  
The quantum mechanical atom;  
Orbitals

Class 5:

Atom Structure and Periodicity:  
Electron configurations;  
Valence electrons  
Periodic trends;

Class 6:

Atom Structure and Periodicity:



Magnetic properties  
Atom to Molecules  
Review for midterm 1

Class 7:  
Midterm 1

Class 8:  
Bonding: General Concepts:  
Ionic bonds  
Metallic bonds  
Covalent bonds

Class 9:  
Quiz 2  
Bonding: General Concepts:  
Bond energy  
Bond length  
Lattice energies  
Molecular Structures & Orbitals:  
VSEPR theory

Class 10:  
Molecular Structures & Orbitals:  
Molecular shape and polarity  
Valence bond theory,

Class 11:  
Quiz 3  
Molecular Structures & Orbitals:  
Molecular orbital theory;  
Intermolecular forces;  
Chemical Energy

Class 12:  
Molecular Structures & Orbitals:  
Matter and Energy;  
Laws of conservation;  
Introduction to thermodynamics  
Review for Midterm 2

Class 13:  
Midterm 2

Class 14:



1st and 2nd law of thermodynamics:

Internal Energy

Specific heat

Enthalpy

Entropy

Class 15:

1st and 2nd law of thermodynamics (Cont.)

Thermochemistry

Calorimetry

Class 16:

Quiz 4

Calorimetry (Cont.)

Phase changes: Gas, Liquid and Solid

Phase diagrams,

Class 17:

Types of solids;

Molar mass, empirical formula;

Class 18:

Molar mass, empirical formula (Cont.);

Chemical equations;

Review for midterm 3

Class 19:

Midterm 3

Class 20:

Chemical equations; (Cont.)

Stoichiometry

Class 21:

Quiz 5

Stoichiometry (Cont.)

Limiting reactants;

Class 22:

Solution stoichiometry;

Precipitation reactions;

Class 23:

Quiz 6

Precipitation reactions (Cont.);



Acid-base reactions;  
Net ionic equations;

Class 24:  
Net ionic equations (Cont.);  
Reduction-oxidation reactions, oxidation numbers

Class 25:  
Summary of the whole semester;  
Review for final

Final Exam (Cumulative): TBA