CHEM 011: General Chemistry I

Term: 2020 Winter Session Instructor: Staff Language of Instruction: English Classroom: TBA Office Hours: TBA
Class Sessions Per Week: 5 Total Weeks: 3 Total Class Sessions: 15 Class Session Length (minutes): 240 Credit Hours: 4

Course Description:

We will study the fundamentals of chemistry. The basic concepts of inorganic, organic, and biochemical systems will be examined. The course also introduces basics of atoms and molecules; molecular structure; periodicity; intermolecular forces; solids, liquids, gases; solutions ; stoichiometry; spectrometry; light and matter; thermochemistry; diatomic and polyatomic molecules. Students will learn to apply the theories and concepts of chemistry to real world issues.

Course Materials:

Chemistry: A Molecular Approach, Nivaldo J Tro, 4th 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.

Grading Scale:

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

Course Assignments:

Quizzes

Quizzes will usually consist of True-False, multiple choices and short answer questions. 5 quizzes will be given. There is 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.

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 35% 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	15%
Midterm Exam 1	25%
Midterm Exam 2	25%
Final Exam	35%
Total	**100%**

Course Schedule:

Week 1- Class 1	Week 1- Class 2
Introduce the Course; Go through the Syllabus; World of Chemistry Measurement and Problem Solving Methodology; Common Metrics	Atoms and Elements: Atoms, ions, electrons, neutrons, protons, atomic mass; Hess's Law; Electromagnetic radiation;
Week 1- Class 3	Week 1- Class 4
Quiz 1	Atom Structure and Periodicity:

Atoms and Elements: Wave-particle duality; Atomic spectra; Atom Structure and Periodicity: The quantum mechanical atom; Orbitals;	Electron configurations; Valence Electrons; Periodic Trends; Magnetic properties; Atom to Molecules
Week 1- Class 5	Week 2- Class 6
Midterm 1 Bonding: General Concepts: Ionic Bonds Metallic Bonds Covalent Bonds	Bonding: General Concepts: Bond Energy Bond Length Lattice Energies Molecular Structures & Orbitals: VSEPR theory
Week 2- Class 7	Week 2- Class 8
Molecular Structures & Orbitals: Molecular shape and polarity Valence Bond Theory; Molecular Orbital Theory	Intermolecular forces; Chemical Energy; Matter and Energy; Laws of conservation; Introduction to thermodynamics
Week 2- Class 9	Week 2- Class 10
1st and 2nd law of thermodynamics: Internal Energy Specific heat Enthalpy Entropy	1st and 2nd law of thermodynamics (Cont.) Thermochemistry Calorimetry
Week 3- Class 11	Week 3- Class 12
Midterm 2 Phase changes: Gas, Liquid and Solid Phase diagrams;	Types of solids; Molar mass, empirical formula; Chemical equations; Stoichiometry

Week 3- Class 13	Week 3- Class 14
Molar mass, empirical formula; (Cont.) Chemical equations; (Cont.) Stoichiometry (Cont.)	Limiting Reactants; Solution Stoichiometry; Precipitation Reactions; Acid-base reactions;
Week 3- Class 15	
Net ionic equations; Reduction of oxidation reactions, oxidation numbers Summary of the whole semester; Review for final	***Final Exam (Cumulative): TBA***

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 Shanghai Normal University'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.