CHEM 113：General Chemistry I(With Lab)

Term: 2021 Summer Session Instructor: Staff Language of Instruction: English Classroom: TBA Office Hours: TBA
Class Sessions Per Week: 5 Total Weeks: 5 Total Class Sessions: 25 Class Session Length (minutes): 145 Credit Hours: 5
Total Lab 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, 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.

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.

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

There will be 5 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 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.

Course Assessment:

5 Quizzes	10%
Labs	20%
Midterm Exam 1	15%

Midterm Exam 2	15%
Midterm Exam 3	15%
Final Exam	25%
Total	**100%**

Course Schedule:

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

	VSEPR theory Molecular Shape and Polarity Valence bond theory	
3.	Inter-molecular Forces Chemical Energy Matter and Energy Law of Conservation Introduction to Thermochemistry Ideal Gas Law, Property of Gas Phase Change, Gasses, Liquids and Solids Phase Diagrams	Homework Assignment Quiz 4 Midterm 2
4.	Property of Liquid, solid and solution Chemical Equations and Stoichiometry Solution Stoichiometry Chemical Reactions Limiting reactants Precipitation reactions	Homework Assignment Quiz 5 Midterm 3
	Oxidation-reductions Reactions	Homework Assignment

5.	Acid-base reactions Net ionic equations Introduction to Nuclear Chemistry Course summary	Quiz 6 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

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.