CHEM 1235 - General Chemistry II (With Lab)

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

Course Description:

General Chemistry II (With Lab) is a continuation of General Chemistry I (With Lab). The following topics will include in this course: chemical kinetics, chemical thermodynamics, equilibrium, electrochemistry, nuclear chemistry, and descriptive chemistry. Students will build a further understanding of the related theoretical principles through a hands-on experience of basic laboratory.

Course Materials:

Chemistry: An Atoms Focused Approach, 3rd edition, Thomas R Gilbert, Rein V Kirss, Stacey Lowery Bretz, Natalie Foster

ISBN-13: 978-0393697452

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:

Attendance:

Attendance at all class sessions is required. You have to notify the instructor in advance of your absence. If you fail to attend class on a regular basis, your final course grade will be lowered. Likewise, you should arrive to class on time. Tardiness is disruptive and disrespectful to me and to your classmates. Please make every effort to arrive punctually.

Quizzes:

There will be six quizzes in total. Short, in-class quizzes will test your comprehension of course

materials. You are supposed to make adequate preparation before each quiz. You are not allowed to consult your classmates or read your textbook or handout during the quizzes. You should be well-prepared before the class. The lowest score will drop off.

Exams:

There will be two midterm exams and one final exam during the course. Exam questions may come from lecture, lab, the text, and/or homework and will be a mix of multiple choice, mathematical problems, and short answers. Please note that you must show your work on arithmetical problems for credit and partial credit. Students are required to take all exams, and there are NO MAKE-UP EXAMS.

Lab Assignments:

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:

Attendance	5%
Labs	15%
Quizzes (5 out of 6)	10%
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
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
1.	Go through syllabus Review on CHEM 113 **Chemical Kinetics**: Introduction to Rate Rate Law: Concentration on the Reaction Rate The integrated Rate Law Temperature, Reaction Rate and Reaction Mechanism Catalysis	Homework Assignment Quiz 1 Lab 1& 2
2.	**Chemical Equilibrium:** Constants in a chemical equilibrium Expressing and Calculating Equilibrium Constants Predicting the Direction of Change Finding Equilibrium Concentrations Le Chatelier's Principle-The Equilibrium Law **Acid and Bases:** The Nature and Definition of Acids and Bases Strength of acid related to structure The pH value, Strong Acids, Weak Acids;	Homework Assignment Quiz 2 Midterm 1 Lab 3& 4
3.	**Acid and Bases:** Base solutions The Acid- Based Properties of Ions and Salts Polyprotic Acid Lewis Acids and Bases **Aqueous Ionic Equilibrium:**	Homework Assignment Quiz 3 and 4 Lab 5& 6

	Introduction to Buffers Buffer Effectiveness Titrations and PH Curve K_sp and solubility; Selective Precipitation and Complex Ion Equilibrium	
4.	**Free Energy and Thermodynamics:** 1st Law of Thermodynamics Entropy and the Second Law of Thermodynamics Conservation of Energy, Internal Energy, Enthalpy 3rd Law of Thermodynamic Free energy **Electrochemistry:** Galvanic/Voltaic Cells Balancing Reactions in Galvanic Cells Standard Electrode Potentials; Cell Potential, Free Energy and the Equilibrium Constants	Homework Assignment Quiz 5 Midterm 2 Lab 7& 8
5.	**Electrochemistry:** Cell Potential and Concentration Batteries and Electrolysis Corrosion **Radioactivity and Nuclear Chemistry:** Nuclear transmutation; Biological effects of radiation Course Summary and Review for Final	Homework Assignment Quiz 6 Lab 9& 10 Final exam

Lab Schedule:

Lab 1: Catalysis
Lab 2: Kinetics of the reaction between hydrogen peroxide and iodide ion
Lab 3: Chemical Equilibrium 1
Lab 4: Chemical Equilibrium 2
Lab 5: Acids and Bases I
Lab 6: Acids and Bases II

Lab 7: Buffers
Lab 8: Thermodynamics
Lab 9: Electrochemical cells
Lab 10: Galvanic Cells
Lab Final Presentation