1. Course Title:

General Chemistry I
CHEM 181 – 4 Credits

4 hr Lecture per week

MET Core Program Requirement

Prerequisite: recommend high school chemistry and qualification for MATH 153 or math placement exam.

This is a basic Science content course under ABET Criterion 5

2. Faculty Member Information:

Instructor: Dr. Yingbin Ge
Office: Science Building 207A
Phone: 509- 963-2817
E-mail: yingbin@cwu.edu

3. Course Description:

This lecture course introduces chemistry concepts such as atoms and molecules, stoichiometry, solution chemistry, thermochemistry, electronic structure of the atom and periodicity and chemical bonding.

4. Textbook and other required materials for the course:

Textbooks: "Chemistry: The Molecular Nature of Matter and Change" , 5th Ed
(ISBN: 0-07-304859-3) by Martin S. Silberberg
Optional: "Student Study Guide" 5th Ed (ISBN: 0-07-304861-1) by Weberg,
Optional: "Student Solutions Manual" 5th Ed (ISBN: 0-07-304860-7)
by Patricia Amarteis and Martin S. Silberberg

5. Specific Learner and Expressive Outcomes and Assessment Strategies:

ABET Outcome Criteria #	Learner Outcomes	Assessment

6. Course Topics and Schedule:

1	Modern Chemistry, scientific approach, and measurement	Chapter 1:	Keys to the study of Chemistry, Definitions chemical arts and origins of modern chemistry, scientific approach, problem solving, measurement, uncertainty and significant figures
2	Atoms and Atomic Theory		The Components of Matter, Elements and compounds, Dalton's atomic theory, nuclear model, elements, nomenclature and formulas and masses

3	Nuclear Chemistry and Radioactivity	Chapter 24.1,5-7: Radioactive decay and nuclear stability, nuclear reactions and their applications, interconversion of mass and energy, fission/fusion
4	Properties of Elements	Chapter 7: Quantum theory and atomic Structure, quantum theory, atomic spectra, wave-particle duality, quantum mechanical model of atom. Chapter 8: Electron configuration and chemical periodicity, periodic table, characteristics of many electron system, quantum mechanical model and periodic table, trends in three key atomic properties periodic table, trends in three key atomic properties (size, ionization potential, electron affinity), atomic structure and chemical reactivity
5	Atomic Bonding	Chapter 9: Models of chemical bonding, atomic properties, ionic bonding model, covalent bonding model, bond energy and chemical change, electronegativity and bond polarity, metallic bonding
6	Molecular Structure	Chapter 10: The shapes of molecules, molecules and ions in Lewis dot and Molecular Bonding structures, VSEPR, molecular shape and polarity. Chapter 11: Theories of covalent bonding, valence bond theory, mode of orbital overlap and types of covalent bonding, molecular orbital theory
7	Mole and Stoichiometry	Chapter 3.1-2: Stoichiometry of formulas, the Mole concept

7. Grading:

Five 10-minute quizzes (25 points each; the lowest score will be dropped.)
Four 50-minute tests (100 points each)
One 100-minute final exam (200 points)
The lowest score of the five tests or half of the score of the final exam, whichever is lower, will be dropped.
Total possible: 25x4 + [4x100 + 200 - 100] = 600 points

Letter grade:

95% and up -> A+	65% and up -> C+
90% and up -> A	60% and up -> C
85% and up -> A-	55% and up -> C-
80% and up -> B+	50% and up -> D+
75% and up -> B	45% and up -> D
70% and up -> B-	40% and up -> D-
	below 40% -> F

Prepared by Roger Beardsley June 22, 2009

1. Course Title:

General Chemistry Laboratory I
CHEM 181L – 1 Credit

3 hr Lab per week
MET Core Program Requirement
Prerequisite: Pre- or co-requisite, CHEM 181
This is a basic Science content course under ABET Criterion 5

2. Faculty Member Information:

Instructor: Dr. Timothy L. Sorey
Office: SCI 30
Phone: 509- 963-2814
E-mail:soreyt@cwu.edu

3. Course Description:

This laboratory supports hands-on inquiry-based approaches to exploring topics presented in CHEM 181. One three-hour lab session weekly.

4. Textbook and other required materials for the course:

- Chemistry: The Central Science 10th edition, Brown, LeMay, and Burston.
- CHEM 181 Lab Manual
- Approved Safety Goggles (*no glasses, no welders goggles*)
  Student Lab Research Notebook – with carbonless copies

5. Specific Learner and Expressive Outcomes and Assessment Strategies:

ABET Outcome Criteria #	Learner Outcomes	Assessment

6. Course Topics and Schedule:

10/2 Lab Syllabus, Check-in, and Measurement Manual – Sections 1-2
10/9 Measurement Manual – Sections 3-4
10/16 Lab #1: Spectroscopy – Qualitative Analysis with Light
10/23 Lab #2: Stoichiometry I – Gravimetric Plant Food Analysis
10/30 Lab #3: Stoichiometry II – Synthesis and Analysis of Alum
11/6 Lab #4: Thermodynamics I: Heat and Calories – Part 1-2
11/13 Lab #4: Thermodynamics I: Heat and Calories – Part 3-4
11/20 Lab #5: Thermodynamics II: Heat of Formation of MgO
11/27 Thanksgiving Break
12/4 Lab Drawer Check Out

7. Grading:

BB Pre-lab Online Quiz	7.1%	10 pts x 5 labs =	50 pts
BB Post-Lab Online Quiz	7.1%	10 pts x 5 labs =	50 pts
Measurement Manual Check	6.4%	15 pts X 3 Sections=	45 pts
Pre-Lab Purpose Statement	8.5%	10 pts X 6 labs =	60 pts
Individual Written Lab Reports	70.9%	100 pts x 5 labs =	500 pts
Total points			**705 pts**

8. ADA Statement:

Students who have special needs or disabilities that may affect their ability to access information and or material presented in this course are encouraged to contact me or Robert Harden, ADA Compliance Officer, Director, ADA Affairs and Students Assistance on campus at 963-2171 for additional disability related educational accommodations.

Prepared by Roger Beardsley June 22, 2009