CHM 2046C
General Chemistry II (5) (A.A.)

Catalog Description: Three hours lecture, three hours lab per week. Prerequisites of CHM 2045C with a grade of “C” or better. These courses meet Area V requirements for A.A./A.A.S./A.S. general education requirements. A rigorous study of chemical principles for students planning science and science related majors.

Performance Standards:

At the successful completion of this course, the student should be able to:

1. Make predictions of gas, liquid and solid behavior, including the effects of intermolecular forces and the utilization of phase diagrams.
2. Make predictions regarding melting points, boiling points, and vapor pressures using these ideas.
3. Describe the behavior and theoretical basis of strong and weak electrolytes and be able to write total and net ionic equations.
4. Define acids and bases in the Arrhenius, Bronsted-Lowry, and Lewis systems, including relative strengths of selected acids and bases.
5. Write balanced equations to represent oxidation-reduction reactions and half-reactions.
6. Perform calculations related to solution chemistry, including quantitative concentrations.
7. Describe thermodynamic and thermochemical processes using current terminology and mathematical relationships.
8. Perform calculations relating thermodynamic properties, including specific heat capacity and state functions.
9. Calculate equivalent weights for both acid-base and oxidation-reduction reactions.
10. Diagram and calculate voltage for electrolytic and galvanic cells.
11. Perform equilibrium calculations for acid-base reactions, solubility, complex ion formation and hydrolysis, including titrations, buffer calculations, and simultaneous equilibria.
12. Write rate laws for zero, first, and second order reactions, demonstrating an understanding of activation energies and reaction mechanisms.
13. Use the Arrhenious equation to determine the effect of temperature on the rate constant, k.
14. Describe the chemistry of selected elements, applying it to qualitative ion analysis.
15. Use colligative properties to describe the effects of solution concentration on freezing point, boiling points, vapor pressure, and gas solubility.
16. Understand the basic concepts of coordination chemistry.

Optional Topics:
1. Identify the major types of crystals, describing the nature of crystalline solids, including basic lattice types and X-ray diffraction.
2. Demonstrate an understanding of the descriptive chemistry of some elements.
3. Discuss nuclear chemistry: sources, protection, and expected decay patterns.