Freshman Year – Spring Semester

CEM 182H Honors Chemistry II

Description: Thermodynamics and chemical equilibria; acids and bases; redox chemistry; main group elements; solid state; group theory and symmetry; molecular orbital theory; transition metal chemistry and spectroscopy.

Credit: 4 hours (3 hours lecture and 1 hour recitation per week)

Prerequisite: (CEM 151 or CEM 181H or LB 171) and ((MTH 126 or concurrently) or (MTH 133 or concurrently) or (MTH 153H or concurrently))

Requires Approval of the Department.

Lecture Topics:

1. The Classification of Chemical Reactions
2. Thermodynamics
3. Redox Reactions
4. Acid-Base Reactions (Theories of Acids and Bases; Aqueous Equilibria; Brønsted-Lowry Acid-Base Equilibria)
5. Alkali Metal Chemistry; Classification of Bonding
6. Alkaline Earth Chemistry and Organometallic Compounds
7. The Solid State; Crystalline Structure
8. Boron and Its Compounds
9. Molecular Symmetry and Group Theory
10. Molecular Orbital Theory
11. Carbon and Silicon
12. Nitrogen and Phosphorus
13. VSEPR and Valence Bond Theory
14. Oxygen and Sulfur
15. Halogens and the Noble Gases
16. Transition Metal Chemistry (Coordination Compounds; Valence Bond Theory and Ligand Field Theory; Molecular Orbital Theory; Spectroscopic and Magnetic Properties of Transition Metal Complexes)
17. Organometallic Compounds of the Transition Metals