

101. Introductory Physical Chemistry (3)

Not open to chemistry majors. Prerequisite: Math 70 or 75; Chem 1B or 2B, 8 or 105. Physics 2A-B recommended. Basic treatment of gas laws, thermodynamics, phase equilibria, properties of solutions, kinetics, spectroscopy, macromolecules and nuclear chemistry. Especially recommended for students in the agricultural, earth, life and physical sciences, engineering and other related areas.

102. Analytical Chemistry (5)

For chemistry majors; recommended for other science majors. Prerequisite: Chem 28. Introduction to principles and methods of analytical chemistry. (3 lecture, 6 lab hours)

105. Quantitative Analysis Laboratory (4)

Not open to chemistry majors. Prerequisite: Chem 8 (or concurrent), Math 4. Laboratory study of principles and methods of quantitative analysis. (2 lecture, 6 lab hours)

106. Analytical Measurements Laboratory (3)

Prerequisite: Chem 102. May not be taken concurrently with 111. Principles and methods of analytical measurements of inorganic and organic substances by instrumental and non-instrumental techniques. (1 lecture, 6 lab hours)

107. Introduction to Radiochemistry (3)

Prerequisite: Phys 2B, Chem 8 or 105. Introduction to applications of radioisotopes, nuclear methods of analysis and radiation safety for students in the physical or biological sciences.

109. Elementary Organic Chemistry Laboratory (3)

Not open to chemistry majors. Prerequisite or concurrently; Chem 8 or 28. Laboratory study of the carbon compounds with coordinating lectures. (1 lecture, 6 lab hours)

110A-B. Physical Chemistry (3-3)

Prerequisite: Chem 1B, 8 or 28; Phys 4A and B, or 2A-B; Math 77. Mathematical treatment of the laws of thermodynamics, reaction kinetics, elementary statistical and quantum mechanics, properties of solutions, kinetic theory of gases, crystal structure, molecular structure, and nuclear chemistry.

111. Physical Chemistry Laboratory (3)

Prerequisite: Chem 110B (or concurrently), Chem 102 or 105. Techniques of physical measurements, error analysis and statistics; ultraviolet, infrared and nuclear magnetic resonance spectroscopy; dipole moments, viscosity, calorimetry, Kinetics, phase diagrams, thermodynamic measurements, and report writing. (1 lecture, 6 lab hours)

115. Quantum Mechanics in Chemistry (3)

Prerequisite: Chem 110A-B. Classical mechanics and vectors; postulates of quantum mechanics, square well, harmonic oscillators, rotor and hydrogen atom problems; approximation techniques; chemical bonding and spectroscopy.

123. Advanced Inorganic Chemistry (2)

Prerequisite: Chem 1B or 4B, 102, and 110A (or concurrently). Nonmathematical treatment of ionic and covalent bonding, atomic structure, molecular structure, and reaction mechanisms. Introduction to visible and infrared spectroscopy of transition metal complexes.

124. Synthesis and Characterization (2)

Prerequisite: Chem 123 (or concurrently). Techniques of preparation to include high temperature reactions, vacuum line and glove box preps, nonaqueous syntheses, solid state reactions. Emphasis on structural characterizations using instrumental methods. (1 lecture, 3 lab hours)

125. Chemistry and Physics of Instrumentation (4)

Prerequisite: Chem 8 or 28 and Chem 105. Structured to train bioscientists in the theory of electricity, basic electronics, light and optical systems and to apply this theory to the design and use of instrumentation typical to the bioscience laboratory. (2 lecture, 6 lab hours)