

General Chemistry 102 Topics:

Liquids, solids, intermolecular Forces and Solution

- Kinetic-molecular description of liquids and solids
- Intermolecular forces and their effects on liquid properties
- Bulk properties of liquids and solids
- Vapor pressures and phase changes
- Phase diagrams
- The solutions process and factors affecting solubility
- Colligative properties of solutes
- Colloids

Chemical kinetics

- Reaction rates and mechanisms
- Catalysis

Chemical equilibrium

- Homogeneous and heterogeneous equilibria
- Le Chatelier's principle
- Relationship between chemical equilibria and chemical kinetics

Acids and bases

- Acidic and basic solutions; pH
- Bronsted-Lowry and Lewis theory of acids and bases
- Strong acids and bases; weak acids and bases
- Titrations and quantitative analysis

Aqueous Ionic Equilibrium

- Buffer solutions and common-ion effect
- Solubility equilibria and the solubility constant
- Qualitative analysis for metallic elements

Free Energy and Thermodynamics

- Spontaneity and thermodynamics; enthalpy
- Entropy and the Second Law of thermodynamics
- Gibbs free energy
- Free energy relationships to equilibrium constant and work

Electrochemistry

- Galvanic and voltaic cells
- EMF, cell potential, and batteries

2015 CHEM102 Detail Course Description

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- The Nernst equation
- Electrolysis and corrosion

Radioactivity and Nuclear chemistry

- Spontaneous radioactivity and transmutation
- Fission and fusion
- Biological effects

Other Topics

Organic and Biochemistry

- Hydrocarbons and their various derivatives
- Petroleum
- Polymers
- Proteins, amino acids
- Carbohydrates, fats
- Nucleic acids and DNA

Chemistry of the Nonmetals

Transition elements and coordination chemistry

- Transition metal oxidation states
- Magnetism in transition metals
- Electrical/heat conduction in metals
- Structure of complexes
- Chelates, nomenclature and isomerism
- Color