UAP/CHEM 111 **Credit: 3.00** **COURSE OUTLINE OF CHEMISTRY**

Lecture #	Topics
1	Introduction to chemistry, why computer engineers need to learn chemistry, outline of the course
2-4	Atomic structure: history, old atom models, Bohr atom model, photoelectric effect, Heisenberg's uncertainty principle, de Broglie relation
5-7	Atomic structure: Quantum mechanics, Schrodinger wave equation, Quantum numbers, size and shape of the orbitals
8-9	Periodic table: Hund's rule, Aufbau principle, paramagnetic and diamagnetic substances, periodic table, periodic properties
9	Class Test-1
9-10	Chemical bond: classification of bonds, ionic bonds and ionic size, Born Haber cycle
11-14	Chemical bond: covalent bonds, VSEPR theory and models, geometry of molecules, VBT to explain bonds, multiple bonds
14	Class Test-2
	Mid Term
15-16	Phase rule and pH: Phase Transitions, Clausius–Clapeyron Equation, Phase, Component, Degree of Freedom, Phase diagram of water, Carbon di oxide and Sulfur, Critical Temperature and Pressure
17	pH: Self Ionization of water and pH
18	Class Test-3
19-20	Solution: Types of solution, Effect of temperature and pressure, Concentration units and conversion
21-22	Colligative properties: Colligative properties, Boiling point elevation, freezing point depression, Osmotic pressure
23-24	Chemical Kinetics: Scope of chemical kinetics, rate and rete laws, order, molecularity, integrated rate expression, effect of temperature on reaction rate
25-26	Chemical Equilibria: Reversibility and equilibrium, thermodynamic equilibrium constant, equilibrium for selective reactions, direction of equilibrium, Le Chatelier's Principle
27	Thermochemistry: Different form of energy, System, boundary, surrounding, state function and path function, Specific heat and heat capacity, Laws of thermochemistry, Heat of neutralization
28	Review

General Chemistry, D.D. Ebbing, 9th edition. General Chemistry, Raymong Chang, 6th edition

Chemistry for Engineering Students, Brown and Holme, 2nd edition