CH 151 ENGINEERING CHEMISTRY – I		
CREDITS= 6 (L = 4, T=0, P = 2)		
1	**Gaseous state:** Ideal and non-ideal behavior of gases, General gas equation, Heat capacities of gases C_p and C_v , C_p /C_v ratio, van der Waals' equation, Liquefaction of gases.	6 Hours
2	**Liquid state:** Measurement of vapor pressure; Effect of temperature on vapor pressure; Clausius-Clapeyron equation; Trouton's rule; Craft's rule. Viscosity & Surface tension of liquids, Osmotic pressure and its determination	7 Hours
3	**Chemical bonding**: Ionic bonding, lattice energy, Born-Haber cycle, Covalent bonding, Metallic bonding, Valence Bond Theory, Molecular Orbital Theory, Hund-Mulliken theory, Fajan's rule, Hydrogen bond, Resonance, Properties of ionic and covalent compounds and metals	8 Hours
4	**General principles and processes of metallurgy**: Occurrence, mineral wealth of India, ore dressing, roasting, calcinations, Gravity separation, Magnetic separation, Froth flotation, Zone refining, smelting, fluxes, slags, Types of furnaces.	8 Hours
5	**Metallurgical industries**: Metallurgical industries of iron and steel, aluminum, copper, lead and zinc.	6 Hours
6	**Water**: Sources, impurities, hardness of water and its estimation, conditioning of water for industrial and domestic purpose, desalination.	5 Hours
REFERENCE BOOKS:		
Title:	University Chemistry	
Author:	Bruce H Mahan	
Publisher:	Adison Wesley	
Title:	Basic Inorganic Chemistry	
Author:	Cotton & Wilkinson	
Publisher:	Wiley Eastern	
Title:	Principles of Physical Chemistry	
Author:	Maron S and Prutton, C.	
Publisher:	Oxford & IBH Publishing Company	
Title:	Physical Chemistry	
Author:	B R Puri, L R Sharma, M S Pathania	
Publisher:	Vishal Publishing Company	

LIST OF EXPERIMENTS		
(1)	Inorganic qualitative analysis of soluble and insoluble salts belonging to group I to groupV, and K^+, NH^{4+},Na^+ having anions CO_3^{2-},S^{2-},X^-,PO_4^{3-},NO_3^-,SO_4^{2-},OH^- etc. (i) **Gr.I** (Ag^+, Hg^+,Pb^{2+} etc.) (ii) **Gr.II** (Cu^{2+}, Hg^{2+},Bi^{3+}, Sn^{2+},Pb^{2+}) (iii) **Gr.III** (Al^{3+},Fe^{3+},Fe^{2+},Cr^{3+}) (iv) **Gr.IV** (Zn^2,Ni^{2+},Mn^{2+} ,Co^{2+}) (v) **Gr.V** (Ca^{2+},Ba^{2+},Sr^{2+}) (vi) **Gr.VI** (Mg^{2+})	
(2)	Volumetric analysis **(i)** Preparation of standard solutions of acids and bases **(ii)** Analysis of sodium carbonate and sodium bicarbonate mixture **(iii)** Determination of hardness of water.	