



Code	Subject Title	Cr. Hrs	Semester
CHEM-103	Chemistry-II (Inorganic Chemistry)	3	II
Year	Discipline		
1	Botany, Zoology, Chemistry-I, II		

Periodicity

Modern periodic table; Similarities and differences in first row elements, their diagonal and vertical relationship with other elements; Electro negativity of elements (Pauling and Mullikan scales); Polarizability and polarizing power of ions; Periodicity in the properties of transition and inner transition elements.

Theories of Chemical Bonding

Nature and types of chemical bonding; Modern concept of valence bond theory (VBT), molecular orbital theory (MOT) and their applications to homo and hetero di- and polyatomic inorganic molecules, explaining the conventional and modified MO diagrams; Valence shell electron pair repulsion theory (VSEPR), explaining the shapes of inorganic molecules (i.e. AB_2 , AB_3 , AB_2E , AB_4 , AB_3E , AB_2E_2 , AB_5 , AB_4E , AB_3E_2 , AB_2E_3 , AB_6 , AB_5E , AB_4E_2) and directed valence theory (Hybridization), Metallic bonds (detailed concept).

Acid-Base Concept

General concept of acids and bases. Detail of Lewis concept of acids and bases; Soft and hard acid-base (SHAB) concept and its applications. Relative strength of acids and bases based on P_k values. Reactions of acids and bases. Relationship between redox reactions and acid base reactions. Indicators and theory of indicators.

Chemistry of d-Block Elements

Electronic configuration and oxidation states of transition elements. Metallurgy of chromium, nickel and copper. Theories of coordination compounds, valence bond theory (VBT), molecular orbital theory (MOT) and crystal field theory (CFT) for tetrahedral and octahedral complexes. Nomenclature and Isomerism in coordination compounds. Chelates. Application of coordination compounds.

Nuclear Chemistry

Phenomena of radioactivity; Natural radioactivity, Radioactive disintegration series, rate of disintegration and half life period, Mass defect and binding energy, nuclear stability; measurement of nuclear radiation, Wilson cloud chamber and Geiger-Muller counter, Carbon dating; Artificial radioactivity and nuclear transformations, Nuclear reactions (fission and fusion), Uses of radioactive isotopes; Biological effect of nuclear radiation.

Chemical Industries

Glass, Soda ash and Soap.

Recommended Books:

1. Cotton, F, Albert, Geoffrey Wilkinson and Paul L. Gaus, "Basic Inorganic Chemistry", John, Wiley & Sons Inc, 3rd Edition (1995).
2. Lee, J.D., "Modern Inorganic Chemistry", Chapman & Hall, 5th Edition (1996).
3. Jolly, William, L., "Modern Inorganic Chemistry", McGraw Hill, 2nd Edition (1991).



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4. Shriver, D.F., P.W. Atkins and C.H. Langford, "Inorganic Chemistry", Oxford, 2nd Edition (1996).
 5. Sharp, A.G. "Inorganic Chemistry", Longman, 3rd Edition (1992).
 6. Rayner Canham, Geiof., "Descriptive Inorganic Chemistry" & Co. (1995).
 7. Jefferey, G.H., j. bassett, J.Mendham and R.C. Denney, "Vogel's text book of Quantitative Chemical analysis", 5th Edition, Benjamin Cummings, (1989).
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