Course No: CH14101CR
Title: Inorganic Chemistry (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

Unit-I: Stereochemistry and Bonding in the Compounds of Main Group Elements. (16 Contact hours)

Valence bond theory- Energy changes taking place during the formation of diatomic molecules; factors affecting the combined wave function. Bent's rule and energetics of hybridization.

Resonance: Conditions, Resonance energy and examples of some inorganic molecules/ions.

Odd electron bonds: Types, properties and molecular orbital treatment.

VSEPR: Recapitulation of assumptions; Shapes of Trigonal bypyramidal, Octahedral and Pentagonal bipyramidal molecules / ions. (PCl_5, VO_3^{-1}, SF_6, $[SiF_6]^{2-}$, $[PbCl_6]^{2-}$ and IF_7).

Limitations of VSEPR theory.

Molecular orbital theory- Salient features, Variation of electron density with internuclear distance.

Relative order of energy levels and molecular orbital diagrams of some heterodiatomic molecules /ions.

Molecular orbital diagram of Polyatomic molecules / ions. Walsh diagrams (Concept only).

Delocalized molecular orbitals:- Butadiene, cyclopentadiene and benzene.

Detections of Hydrogen bond: UV – Vis ; IR and X-ray ; Importance of hydrogen bonding.

Unit-II: Bonding in Coordination Compounds and Metal Clusters: (16 Contact hours)

Structural (ionic radii) and thermodynamic (hydration and lattice energies) effects of crystal field splitting. Jahn -Teller distortion, spectrochemical series and the nephleuxetic effect.

Evidence of covalent bonding in transition metal complexes; Adjusted crystal field theory.

Molecular orbital theory of bonding in octahedral complexes:- composition of ligand group orbitals;molecular orbitals and energy level diagram for sigma bonded ML6; Effect of pi-bonding.

Molecular orbital and energy level diagram for Square-planar and Tetrahedral complexes.

Metal Clusters: Introduction to metal clusters; Dinuclear species ; Metal –metal multiple bonds.

Unit-III: Metal- Ligand Equilibria in Solution (16 Contact hours)

Stepwise and overall formation constants. Factors affecting stability of complexes with respect to the nature of metal ion and ligands. Stability of uncommon oxidation states.

Determination of formation constants by pH- metry and spectrophotometry.

Metal Chelates: Characteristics; Chelate effect and the factors affecting stability of metal chelates.

Applications of metal chelates in chemical analysis and medicine.

Complexes of macrocyclic ligands:- Crown ethers and cryptands.

Unit-IV: pi- Complexes and Iso- Heteropolymetallates of Transition Metals: (16 Contact hours)

Transition Metal Carbonyls: Carbon monoxide as ligand; Synthesis, reactions, structures and bonding of mono- and poly-nuclear carbonyls. Vibrational spectra of metal carbonyls for structural diagnosis.

Prepration, reactions, structure and bonding of transition metal nitrosyls, dinitrogen and dioxygen complexes of transition metals.

Tertiary phosphine as ligand.

ISO - and Heteropolymetallates :-Synthesis, reactions , and structure of polyanions of Vanadium, Molybdenum and Tungsten. Applications of polyacids.

Books Recommended:

1. Advanced Inorganic Chemistry, 5th ed. / 6th ed., F.A. Cotton , G. Wilkinson ; Wiley 1998/1999
2. Inorganic Chemistry, 4th ed. J. E. Huheey, E. A. Keiter….. Harper Collins, 1993.
3. Inorganic Chemistry- G. Wulfsberg ; Viva ; 2002
4. Chemistry of the Elements 2nd ed. - N. N. Greenwood, A. Earnshaw (Butterworth, 1997)
5. Inorganic Chemistry, 3rd ed. - D. F. Shriver, P. W. Atkins ; Oxford, 1999.
6. Inorganic Chemistry – K.F. Purcell, J.C Kotz ;Saunders, 1977.
7. Coordination Chemistry - D. Banerjea ; Tata McGraw Hill, 1993.

Course No: CH14102CR
Title: Physical Chemistry (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

Unit-I: Quantum Chemistry (16 Contact hours)

Exact quantum mechanical results:

Time-independent and time-dependent Schrodinger equation. Postulates of quantum mechanics. Operator concept, quantum mechanical operators in Cartesian and Spherical polar co-ordinate systems, some properties of quantum mechanical operators. Review of particle in a box problem. The solution of problems of harmonic oscillator & the rigid rotator. Tunneling effect.

Born-Oppenheimer approximation. Solution of the Hydrogen-like atom problem- radial and angular wave functions.

Unit-II: Surface Chemistry (16 Contact hours)

Liquid Surface: Surface tension, pressure difference across curved surfaces (Laplace equation), vapor pressure of droplets (Kelvin equation), Capillary condensation.

Solid liquid interface: Contact angle, young's equation, wetting, Wetting as contact angle phenomena.

Thermodynamics of Interfaces: surface excess, surface tension and thermodynamic parameters, Gibbs adsorption isotherm.

Solid surfaces: Adsorption at solid surfaces, adsorption models; Langmuir adsorption isotherm, BET adsorption isotherm and its use in estimation of surface area. Adsorption on porous solids.

Unit- III: Statistical Thermodynamics (16 Contact hours)

Concept of distribution, thermodynamic probability and most probable distribution. Sterling approximation.

Distribution Laws: Derivation of Boltzmann distribution law, Bose-Einestein and Fermi-Dirac laws (without derivation) and their comparison with Boltzmann distribution law.

Partition function & its significance, translational, rotational, vibrational and electronic partition functions. Calculation of thermodynamic properties in terms of partition functions , application to ideal monoatomic & diatomic gases. Equilibrium constant in terms of partition functions with application to isomerization and atomization reactions..

Unit-IV: Chemical kinetics (16 Contact hours)

Fast reactions: General features of fast reactions, study of fast reactions by flow method, relaxation method and flash photolysis.

Theories of Chemical Reactions: Activated complex theory of reaction rates, statistical & thermodynamic formulations, comparison with collision theory

Theories of unimolecular reactions (Lindman, Hinshelwood , RRK and RRKM theories), Introduction to potential energy surfaces.

Surface Reactions: Unimolecular & bimolecular surface reactions [Langmuir-Hinshelwood & Langnuir- Riedel mechanism], classical & statistical treatments.

Reactions in solutions: Diffusion controlled reactions (partial & full microscopic diffusion control), Ionic Reactions; Single & double sphere models of ionic reactions, Hammett equation, Taft equation.

Books Recommended:

1. Physical Chemistry - P. W. Atkins, ELBS , Oxford, 1997.
2. Physical Chemistry- A Molecular Approach - D. A. McQuarie & J. D. Simon, University Science Books, 1997.
3. Introduction to Quantum chemistry - A. K. Chandra, TataMcGraw Hill, 1997.
4. Quantum Chemistry - Ira. N. Levine, Prentice Hall, 2000.
5. Quantum Chemistry, Prasad, New Age Publishers, 2000.
6. Physics and Chemistry of Interfaces, H-J, Butt, K. Graf and M. Kappl, 2nd Edition, Wiley-VCH Verlag Gmbh and Co. KGaA, 2006.
7. Physical Chemistry of Surfaces, A. W. Adamson and A. P. Gast, 6th Edition, John Wiley and Sons, Inc. 1997.
8. An Introduction to Statistical Thermodynamics, Robert P. H. Gasser and W. Graham Richards, World Scientific Publishing Co. 1995
9. Statistical Thermodynamics, M.C.Gupta, New Age International, 1993.
10. Statistical Mechanics, Agarwal, Eisner, Wiley, 1991.
11. Introduction to Statistical Thermodynamics, Chandler, OUP, 1987.
12. An introduction to Statistical Thermodynamics, Hill, Addison-wesley, 1987.
13. Chemical Kinetics, K. J. Laidler, Mcgraw-Hill, 1987.
14. Chemical Kinetics and Dynamics, J. I. Steinfeld, J. S. Francisco, W.L. Hase, Prentice Hall, 1989
15. Chemical Kinetics and Catalysis, R.I. Masel, Wiley, 2001

Course No. CH14103CR
Title: Laboratory Course in Inorganic Chemistry-I (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

I. Preparation of Coordination compounds of Transition metals:

1. Theoretical appraise of first row Transition metal Coordination Chemistry.
2. Synthesis as a Laboratory Technique (Concepts, Calculations and Design of Synthetic procedures).
3. Selected preparations of the following coordination compounds with the specific objectives:

i) Mercurytetrathiocyanatocobaltate(II)		:To visualize the complexation process.
ii) Tristhioureacopper(I)sulphate monohydrate	:	Insitu generation and Stabilization of unusual oxidation state and re-crystallization /crystal growing
iii) Hexaamminecobalt(III) chloride	:	Multistep synthetic procedure
iv) Trisethylenediaminecobalt(III) chloride	:	Two stage synthesis and aerial oxidation/Resolution of a racemic mixture
v) Ammonium dodeca molbedophosphate	:	Synthesis of a heteroploy metallate/ Bonding and structure.

II. Inorganic Quantitative Analyses:

A. **Gravimetry:**

i) Skill and importance of weighing in Chemistry, Gravimetreric Calculations

ii) Precipitation process in homogenous mixtures, Precipitating agents, conditions of precipitation.

iii) Precipitate processing(Digestion, Ignition); reducing precipitation errors(Co- and post precipitation)

B. **Tritimetry:**

i) Types and skill of titration, concept of Complexometric titrations, tritimeteric calculations.

ii) Metallochromic Indicators: selection, structure, and mechanism of action.

III) Role and selection of buffers in Complexometreric titrations, EDTA Back titrations.

Separation and estimation of following Binary metal ion systems using Gravimetry&Tritimetry simultaneously:

i) Silver (Ag^{+}) as AgCl and Nickel (Ni^{2+}) as $[NiEDTA]^{2-}$ complex.
ii) Barium (Ba^{2+}) as BaSO4 and Zinc as $[ZnEDTA]^{2-}$ complex.
iii) Barium (Ba^{2+}) as $BaSO_4$ and Nickel (Ni^{2+}) as $[NiEDTA]^{2-}$ complex.
iv) Nickel (Ni^{2+}) as Ni $(dmg)_2$ complex and Magnesium (Mg^{2+}) as $[Mg\ EDTA]^{2-}$ complex.
v) Copper (Cu^{2+}) as CuSCN and Magnesium (Mg^{2+}) as $[MgEDTA]^{2-}$ complex.

Books Recommended:

1. Advanced Inorganic Chemistry, 5th ed. / 6th ed., F.A. Cotton , G. Wilkinson ; Wiley 1998/1999
2. Coordination Chemistry - D. Banerjea ; Tata McGraw Hill, 1993.
3. Vogel's Textbook of Quantitative chemical Analysis; 5th edn; Jeffery, Bassett; (ELBS, 1989).
4. Quantitative Analysis; 6th edn; Day, Underwood (Printice Hall, 1993).
5. Analytical Chemistry, 6th Ed; D. Christian, Wiley.
6. Quantitative Analysis; 6th edn; Day, Underwood (Printice Hall, 1993).

Course No: CH14104EA
Title: Basic Concepts in Organic Chemistry (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

Unit-I: Delocalized Chemical bonding (16 Contact hours)

Overview: Inductive effect. Conjugation, Cross conjugation, Hyperconjugation–Isovalent and sacrificial hyperconjugations, Acids / Bases, Nucleophiles and Electrophiles. Resonance, Rules of resonance, Steric inhibition of resonance.

Aromaticity: Huckel rule and concept of aromaticity, Molecular orbital diagram of annulenes, Frost diagram. Relation between NMR and aromaticity.

Annulenes: Systems with electron numbers other than six (2,4,8,10 and more than ten π-electron systems), Aromaticity of hetero annulenes. Carcinogenesis due to aromatic hydrocarbons. Aromaticity in fused ring systems. Aromaticity of ferrocene and azulene. Anti and Homoaromaticity

Tautomerism: Different types including valence tautomerism.

Unit -II : Reactive Intermediates and Reaction Mechanism (16 Contact hours)

Reactive Intermediates: Generation, Structure, fate and stability of carbocations, (Classical and non- classical) carbanions, free radicals, carbenes, nitrenes and radical ions

Reaction Mechanism: Reaction Mechanism & Types of reactions. Determining reaction mechanism: Structure of product, Transition state & intermediate (Hammond postulate). Catalysis including acid and base catalysis, Specific acid and base catalysis. Fate of individual atoms (Isotope Labeling). Stereochemical course of reaction. Thermodynamic and kinetic evidences. Correlation of structure – reactivity. The Hammet relationship.

Unit-III : Aliphatic Nucleophilic Substitutions : (16 Contact hours)

Mechanism and stereochemical implications of S_N2, S_N1, S_Ni and Neighbouring Group Participation (by π and σ-bonds) reactions. Comparison of S_N1 and S_N2 reactions.Effect of substrate structure, attacking nucleophile, leaving group and solvent on the rates of S_N1 and S_N2 reactions. Mixed S_N1 and S_N2 reactions. Nucleophilic substitution at allylic, benzylic, aliphatic trigonal and vinylic carbons. Nucleophilic substitution in alcohols, Mitsunobu reactions.Substitutions on other elements. Functional group transformation using S_N2 reactions in organic synthesis. Nucleophilic substitutions in biological systems

Elimination reactions: Factors affecting elimination reactions, Mechanism of E1, E2, E1cB and E2C reactions. Competition between substitution and elimination reactions. Stereochemistry and regioselectivity of E2 eliminations, Elimination in cyclic systems and vinyl halides. Mechanism and orientation in pyrolytic eliminations, Shapiro reaction.

Aliphatic Electrophilic Substitutions

General mechanism of S_E1, S_E2 and S_Ei reactions. Mechanisms of reactions involving migration of double bond. Effect of substrate, leaving group and solvent on reactivity. Stork-enamine reaction.

Unit – IV Stereochemistry: (16 Contact hours)

Molecular symmetry and Chirality , Chirality due to chiral carbon in other quadrivalent chiral atoms. Chirality in compounds with tervalent chiral atoms. Charality in suitably substituted adamantanes. Charlity due to restricted rotation (leading to perpendicular dissymmetric planes), biphenyls and allenes. Chirality due to helical shape. Chirality / optical activity caused by restricted rotation of other types.

Creating a chiral Centre , molecules with more than one chiral centre, Asymmetric synthesis in nature. Enantiotopic diasteroic topic groups and faces. Significance of chirality in biomolecules.

Conformational analysis of cycloalkanes, with more than one substituents and decalines. Effect of conformation and reactivity : SN^1 reaction and epoxidation reactions.

Conformation and reactivity of cyclohexene and cyclohexanone. Conformation of sugars , steric strain due to unavoidable crowding.

Books Recommended:

1. Advanced Organic Chemistry Reactions, Mechanism and Structure, 5th Ed.-Jerry March. (Wiley, 1999).
2. Advanced Organic Chemistry 4th Ed. - F. A. Carey and R. J. Sundberg. (Plenum, 2001).
3. A Guide Book to Mechanism in Organic Chemistry 6th Ed.- Peter Sykes. (Longman, 1996).
4. Structure and Mechanism in Organic Chemistry 2nd Ed. - C. K. Ingold. (CBS, 1994).
5. Modern Organic Reactions 2nd Ed. - H.O. House (Benjamin, 1972)
6. Principles of Organic Synthesis 2nd Ed. - R.O.C. Norman (Chapmann Hall, 1978)
7. Reaction Mechanism in Organic Chemistry 3rd Ed. - S.M. Mukherjee and S.P. Singh. (Macmillan, 1998).
8. Stereochemistry of Organic Compounds 2nd Ed.- D. Nasipuri. (New Age Inter., 1994)
9. Stereochemistry of Carbon Compounds - E.L.Eliel. (TMH, 1995)
10. Stereochemistry of Organic Compounds 3rd Ed. - P.S. Kalsi. (New Age Inter., 1995).
11. Organic Chemistry - J. Hornback. (Brooks/Cole, 1998)
12. Fundamentals of Organic Chemistry , 5th ed.- Solomons. (Wiley, 1992)
13. Organic Chemistry, 5th Ed.- John McMurry. (Brooks/Cole, 2000).

Course No: CH14105EA
Title: Symmetry and Spectroscopy (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

Unit I: Symmetry -I (16 Contact hours)

Symmetry elements and operations; combination of symmetry operations. Groups, subgroups, classes and group multiplication tables. Symmetry point groups Schoenflies notations of point groups; identification of point groups. Systematic procedure for assignment of point groups to molecules; Symmetry classes and their geometrical significance.

Unit II: Symmetry -II (16 Contact hours)

Matrices and their combinations, block factored matrices; matrix representation of symmetry operation and point groups. Reducible and irreducible representation, character of a representation, properties of irreducible representations, Mulliken Symbols for IRS. Character table, construction of character tables for C2v, C3v and C4v point groups.

Applications of symmetry: Molecular chirality, Polarity, Fluxionality, and IR and Raman spectroscopy.

Unit III: Electronic Spectroscopy (16 Contact hours)

Interaction of light with matter, transition probability, transition moment integral, derivation of selection rules.

Intensity of spectral lines; Einstein's treatment of absorption and emission processes. Oscillator strength.

Natural spectral line width, broadening of spectral lines -Doppler and Collision effects,

Electronic Spectroscopy

Vibronic transitions. Intensity of spectra—the Franck-Condon principle.

Electronic spectra of organic molecules; chromophores , auxochrome, spectral shifts Different types of electronic transitions; nomenclature, symmetry labels of electronic states--spectra of formaldehyde. Effects of solvent, electron withdrawing and electron donating groups, conjugation and extended conjugation on the position of spectral bands.

Photoelectron Spectroscopy

Basic principles- photoionization process; ionization energies; Koopman's theorem. Photoelectron spectra of simple molecules (N_2, O_2), ESCA - Application.

Unit IV: Infrared and Raman Spectroscopy (16 Contact hours)

Infrared Spectroscopy

Linear harmonic oscillator- classical and quantum treatment of vibrations, vibrational energies of diatomic molecules, zero point energy, force constant and bond strength, anharmonicity, Morse potential energy levels. Fundamental bands, overtones and hot bands. Vibration-rotation spectra of diatomic molecules; P, Q and R branches;

Vibrations of polyatomic molecules: Normal vibrational modes, selection rules; combination and difference bands. Factors influencing the band positions and intensities. Group frequencies and finger print region.

Raman Spectroscopy

Classical and Quantum theories of Raman scattering, Molecular polarizability, rotational, vibrational, and vibrational-rotational Raman spectra. Selection rules; rule of mutual exclusion. Applications.

Books Recommended:

1. Physical Methods for Chemists , 2nd edn. R.S.Drago (Saunders, 1992)
2. Fundamentals of Molecular Spectrsocopy, 4th edn- C.N.Banwell, E.M.Mc Cash (Tata McGrawHill, 1994)
3. Modern Spectroscopy- J.M.Hollas (Wiley, 1987)
4. Basic Principles of Spectroscopy- R.Chang (McGraw Hill, 1971)
5. Structural Methods in Inorganic Chemistry, 2nd edn. E.A.V.Ebsworth, D.W.H.Rankin, S.Cradock (Blackwell, 1991)
6. Chemical Applications of Group Theory, 2nd edn.-F.A.Cotton (Wiley Eastern, 1994)
7. Molecular Symmetry and Group Theory- L.Carter (Wiley 1998)
8. Symmetry and Spectroscopy of Molecules- K.Veera Reddy (New Age, 1998).

Course Code: CH14106EA

Title: Laboratory Course in Inorganic Chemistry-II (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

I. Qualitative Analyses by Semi Micro Technique:

1. Discussion about the analysis scheme. Analytical groups and Group reagents.
2. Scales of Analysis, Skill of semi micro technique.
3. Chemistry involved in separation and identification of less familiar cations by semi micro analysis.
4. Identification of four metal ions from different analytical groups with simple and complex combinations:
   (i) Group I and II A
   (ii) Group I, II A and II B
   (iii) Group IIA and II B
   (iv) Group I and Group III
   (v) Group II B and Group III
   (vi) Group III only.

II.Chromatography:

A. **Paper Chromatography:**

(i) Principle, Separation process, Technique of Paper Chromatography. Design of mobile phase.
(ii) Methods of paper chromatography (Ascending, Descending and Radial)
(iii) Comparative mobile phase study of separating mixtures. Chromatogram analysis and Interpretation.

B.**Thin layer Chromatography :**

(i) Principle. Skill of TLC, Choice of mobile phase, Comparative mobile phase study of systems .
(ii) TLC as reaction monitoring tool in synthesis.
(iii) Selection of locating / visualizing reagents, location by Ultra violet radiation.

Separation and Identification of Binary and Ternary metal ion mixtures of simple and complex combinations Using Ascending and Radial methods of Paper Chromatography.

Comparative mobile Phase Study of different Separating Mixtures. Monitoring the progress/ completion of a reaction using thin layer Chromatography.

Books Recommended:

1. Vogel's Qualitative Inorganic Analysis; 6^{th} edn; Svehla (Longman, 1994)
2. Chromatographic methods A.Braithwaite and F.J.Smith fifth edition-kluwer academic publishers 1999 ISBN 0751401587
3. Essence of Chromatography Colin.F.Poole-Elsevier.Inc
4. Modern Analytical Chemistry, David Harvey, McGraw-HillHigher Education, 2000.
5. Chromatographic Methods; 3rd ed; Stock & Rice (Chapman & Hall, 1980).

Course No: CH14107EO

Title: Chemistry in Everyday Life-I (04 Credits)

Max. Marks: *100* ***Duration:*** *64 Contact hours*
External Exam: *80 Marks.* ***Internal Assessment****: 20 Marks*

Unit-I : ***(16 contact hours)***

(a) Household Chemicals

Soaps, detergents, Optical brightens and bleaching agents.

Haircare products: Shampoos , Conditioners ,Dyes, Hair curlings and Permanents.

Deodorants and Antiperspirants

Perfumes, Tooth Pastes and Sunscreen lotions.

(b) Agro Chemicals:

Composition and properties of soil, Inorganic and Organic components of soil.

Plant nutrients: Secondary and micro nutrients and their functions.

Fertilizers: Inorganic and Organic fertilizers.

Insecticides, Pesticides and herbicides, Environment and health problems with synthetic pesticides.

Alternate method of insect control: Pheromones , Hormones and Biological control.

Neem: The Worlds Pharmacy.

Unit II: ***(16 contact hours)***

Polymers and Plastics: Characteristics and Types of Polymers.

The big six of Polymer: Low Density Polyethylene (LDPE) , High Density Polyethylene (HDPE), Polypropylene PP), Polystyrene (PS), Polyvinyl Chloride (PVC) and Polyethylene - Tetra phthalate (PET or PETE) : their chemical characteristics and uses.

Chemical Features and Applications/Uses of other Polymers: Natural rubber, Synthetic rubber, Polyesters, Polyamides, Polyurethanes, Polyacrylonitriles, Polystyrene and Teflon.

Personal Polymers: Teflon ear bone, Fallopian tube, Heart valve, Contact lenses.

Problems with Polymers: Disposal, Recycling and Environmental concerns.

Ceramics: Composition, structure and properties of ceramics. How to make ceramics.

Silicate Ceramics: Potteries and Clay products. Glass (composition of various glasses),

Cements: Composition of Portland cement.

Unit-III: ***(16 contact hours)***

(a) Carbohydrates: Definition, classifications. Significance of right and left handedness. Production through photosynthesis

Composition and functions of Monosaccharides : Glucose, Fructose and Galactose.

Disaccharides: Sucrose, lactose and Maltose. Invert Sugar.

Polysaccharides: Starch, glycogen and Cellulose.

Aerobic and Anaerobic metabolism

(b) Lipids: Oils and Fats : Fatty acids and Triglycerides. Saturated and Unsaturated fatty acids (MUFA and PUFA). Rancidity of Oils & Fats. Absorption of toxic substances by fat.

Steroids: Cholesterol, transport of Cholesterol in blood stream. Cholesterol and heart diseases, Recommended values of HDL and LDL , Steroidal hormones and anabolic steroids

Unit-IV: ***(16 contact hours)***

Proteins: Introduction Amino Acids, Structural features and classification. Primary, Secondary, Tertiary and Quaternary structures of proteins and their significance. Denaturation and Renaturation of proteins. Urea cycle.

Enzymes: Classification. Theories of mechanism of action of Enzymes ; Fisher Lock and Key Theory, Koshland's Induced Fit Theory. Mechanism of action of Chymotrypsin and Carboxypeptidase.

Nucleic acids: Features and functions of DNA and RNA.

Vitamins: Classes of Vitamins and their functions. Vitamin deficiency diseases.

Minerals: Macro and Micro minerals. Their functions and diseases caused by their deficiencies.

Books Recommended :

1. Chemistry in Context, 4th Ed.; Applying Chemistry to Society (McGraw Hill) – 2013.
2. Principles of Modern Chemistry, 2nd Ed. , Oxtoby and Nachtrieb , (Saunders College Publications) – 1987.
3. Chemistry Fundamentals - An Environmental Prospective ; 2nd Ed. , Buell and Girad, (Jones and Barlett) – 2013.
4. www.chemistryincontext (American Chemical Society)