

Core Course III (CC) – General Biochemistry

Unit I – Cell and its function

Composition of living matter. Biochemistry of bacterial, animal and plant cell. Specialized components of microorganisms and their structure and function.

Unit II - Enzymes

Enzymes as biocatalysts, enzyme classification, specificity, active site, unit activity, isozymes. Enzyme kinetics: Michaelis – Menton equation for simple enzymes. Enzyme inhibition.

Unit III – Types of macromolecules and their biosynthesis

Structural features and chemistry of macromolecules. Nucleic acid – properties, biosynthesis and degradation of purines and pyrimidines - Structure of DNA and RNA. Proteins – classification – aminoacids - primary-secondary-tertiary – quaternary and three dimensional structure of proteins. Carbohydrates - mono, di, oligo and polysaccharides. Lipids and biomolecules: Fatty acids, properties, -oxidation - biosynthesis of cholesterol.

Unit IV - Bioenergetics

Bioenergetics and strategy of metabolism - flow of energy through biosphere, strategy of energy production in the cell. Oxidation – reduction reactions, coupled reactions and group transfer. ATP production, structural features of biomembranes, transport, free energy and spontaneity of reaction, G , G° , G' and equilibrium. Basic concepts of acids, base, pH and buffers.

Unit V – Metabolism – basic Concepts

Cell metabolism - catabolic principles and break down of carbohydrates, lipids, proteins and nucleic acids - biosynthesis of macromolecules - vitamins and their role as coenzymes.

Reference:

- Christopher K. Mathews and Van Holde, K.E. (1996). Biochemistry.(2nd edition).The Benjamin/Cummings publishing company,Inc.
- David E. Metzler. And Carol M. Metzler (2001). Biochemistry-The chemical reactions of living cells- Vol1&2.(2nd edition).Harcourt/Academic press, Newyork.
- Donald Voet and Judith G. Voet (1995). Biochemistry – Second Edition. John Willey and Sons, Inc.
- Freifelder, D. (1996) Molecular Biology, II Edition, Narosa Publishing House, New Delhi.
- Geofferey, L and Zubay (1998). Biochemsitry. (Fourth Edition) Wm. C. Brown Publishers.
- Jeremy M.Berg. John L. Tymoczko and Lubert stryer (2002). Biochemistry.(5th edition).W.H.Freeman and company, Newyork.
- Lubert Stryer.(1995). Biochemistry.(4th edition). W.H. Freeman and company, Newyork.
- Reginald, H., Garret & Charles M. Grishm. (1998). Biochemistry (Second Edition) Saunders College Publishing.
- Thomas M. Devlin. (2002). Textbook of Biochemistry with clinical correlations.(5th edition).A John Wiley and sons,Inc.,publication,Newyork.
- Trudy McKee.and James R.McKee. (1999). Biochemistry-An Introduction.(2nd edition).WCB McGraw- Hill,U.S.A