

Unit – I

Physical and Chemical Properties of Water: Structure and chemical properties - Solute effects on water: state of water in foods - Kinetic principles - Water activity: principles, measurement, control, effects, related concepts - Acid-base chemistry of foods and common additives.

Unit – II

Proteins: Physical properties of proteins in relation to protein structure - Analytical methods (brief overview) - Basic properties: hydration, ionization, colloidal behavior. Functional properties - Effects of food processing: changes occurring in chemical, functional and nutritional properties of proteins.

Unit - III

Carbohydrates: Simple sugars, sugar derivatives and oligosaccharides - Basic chemistry; conformation, anomeric forms, equilibria, reactivity, sweetness - Sugar derivatives: sugar alcohols, glycosides, etc.- Browning and related reactions - Case studies – acrylamide and furan formation in foods - Polysaccharides - Basic structures and properties: starches, celluloses, gums, modification techniques- Dietary fiber: components, properties, analysis - Actions of carbohydrates in foods.

Unit – IV

Lipids: Content and role in foods - Analytical methods - Chemical, nutritional and physical properties - Processing of fats and oils - Degradation reactions.

Unit - V

Enzymes: Factors affecting reaction rate; characteristics of enzymatic reactions - Deleterious enzymes in food systems: phenoloxidase example- Reactions catalyzed by enzyme, nonenzymatic formation of melanin - Approaches to inhibition of browning- Ascorbate and sulfite chemistry, effects, and mechanisms - Chemistry, effects and safety concerns of sulfiting agents in foods – Applications of enzymes in foods.

TEXT BOOKS/ REFERENCES:

1. Belitz H.-D, Werner Grosch and Peter Schieberle, 2009. **Food Chemistry**, 4th edition, Springer-Verlag Berlin Heidelberg.
2. Srinivasan Damodaran, Kirk.L.Parkin, 2017, **Fennema's Food Chemistry**, 5th Edition, CRC Publication.
3. John.M.Deman, John.W.Finley.W.Jeffrey Hurst. Chang yong Lee. 2018, **Principles of food Chemistry**, 4th edition, Springer Publication.
4. S.Suzanne Neilson. 2017, **Food Analysis**, 5th Edition, Springer Publication.
5. Jan Velisek, 2014, **The Chemistry of Food**, 1st Edition, Wiley Blackwell publication.