## Semester: 1st

Course Title: **BIOMOLECULES**
Course Code: **UGBCH18C101** Credits: **6 (4+2)**

**Theory** Credits: **4**

**UNIT I:**
Water, pH, buffer, Henderson–Hasselbatch equation, Thermodynamic principles. Structure and Classification of Amino Acids, Stereoisomerism and RS System, Optical isomerism. Proteins: Classification, composition and functions, Peptide Bond, Polypeptide chain (Amino acids sequence) determination, Levels of protein architecture and forces stabilising Tertiary/Quaternary structure.

**UNIT II:**
Introduction and classification of carbohydrates, Monosaccharides: open and ring structure,anomeric forms, mutarotation, Reactions of monosaccharides (reference to glucose). Structure and functions of disaccharides, Polysaccharides, Proteoglycans, Lipopolysaccharides, Mucopolysaccharides.

**UNIT III:**
Fatty acids: Nomenclature, classification, structure and functions, Saturated and unsaturated fatty acids, Essential fatty acids. Hydrolysis, Saponification value, Reichert-Meissel number, Iodine number, Rancidity. Triacylglycerols and Cholesterol, Phospholipids, Sphingolipids, Prostaglandins and Leucotrienes.

**UNIT IV:**
Composition of DNA and RNA, features of DNA double helix, types of RNA, central dogma of molecular biology, DNA as Genetic Material.
Vitamins: Fat-soluble and water-soluble vitamins, deficiencies of vitamin B1, vitamin B6, vitamin C, vitamin D.

**Laboratory Course (Practicals) of UGBCH18C101:** Credits: **2**

1. Standardization of buffers and determination of pH of solutions.
2. Qualitative tests for amino acids and proteins.
3. Qualitative tests for carbohydrates.
4. Qualitative tests for lipids.
5. Estimation of ascorbic acid.

**Suggested Readings:**
1. Principles of Biochemistry by Lehninger et al.
2. Biochemistry by Stryer et al.
3. An Introduction to Practical Biochemistry by Plummer.
4. Bioanalytical Chemistry by S E H Rizvi.