

INSTITUTE	FACULTY OF SCIENCE
PROGRAM	BACHELOR OF SCIENCE (MICROBIOLOGY)
SEMESTER	2
COURSE TITLE	BIOMOLECULES
COURSE CODE	02MB0155
COURSE CREDITS	4

Objective:

- 1 To provide students with an organized approach of molecules of living systems and their functions and applications.

Course Outcomes: After completion of this course, student will be able to:

- 1 Understand the concepts & properties of molecules and their reactions.
- 2 Better understanding about the structure, composition & properties of various biomolecules like carbohydrate, nucleic acids lipids, proteins and vitamins etc.
- 3 Better understanding about the biological roles of biomolecules.
- 4 Developing concepts about biological functions & applications of biomolecules in various fields.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	Basics of Chemistry Atoms, Ions, Molecules, Chemical Bonds, Properties of Water, Solvent & Solute, Types of Chemical Reactions, Acid-Base, Buffers.	15
2	Carbohydrates & Nucleic Acids Mono, Oligo & Polysaccharides; Structure, Physical, Chemical & Biological properties; Classification of carbohydrates; Biological Functions & Applications., Nucleosides & Nucleotides, Structure & Functions of DNA; Forms of DNA (A, B and Z); Structure & Functions of t-RNA, r-RNA, and m-RNA.	15

Contents : Unit	Topics	Contact Hours
3	Amino Acids & Proteins Basic Structure, Classifications and Properties of Amino acids; Peptide bonds. Proteins: Primary, Secondary, Tertiary & Quaternary Structures of Proteins; Protein: Functions & Applications.	15
4	Lipids & Vitamins: Introduction of Lipids; Structure, classification (saturated, unsaturated, branched) and properties of fatty acids; Lipid Classification-Simple, Complex and Derived lipids (triglycerides, waxes, phospholipids, sphingolipids, terpenes, and steroids), functions and applications., Vitamins: Sources, Structure and biological function of Vitamins	15
Total Hours		60

Textbook :

- 1 Biochemistry, U. Satyanarayana,, Elsevier, 2013
- 2 Physical biochemistry: Principles and applications, David Sheeham,, John Wiley and Sons., 2009
- 3 Fundamentals of Biochemistry,, Donald Voet, Judith G. Voet, W. Pratt,, Wiley publishers., 2016

References:

- 1 Applications to Biochemistry & Molecular Biology,, Applications to Biochemistry & Molecular Biology,, David Freifelder , W. H. Freeman., 1982
- 2 Principles of Biochemistry, Principles of Biochemistry, David L. Nelson and Michael M. Cox,, W. H. Freeman., 2007

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
25.00	25.00	25.00	10.00	10.00	5.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the class-room in the form of attendance, assignments, verbal interactions etc.

Supplementary Resources:

- 1 <https://www.toppr.com/ask/content/posts/biomolecules/notes-30076/>
- 2 <https://unacademy.com/content/wp-content/uploads/sites/2/2022/10/32.-Biomolecule-Notes.pdf>