INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**MASTER OF SCIENCE (MICROBIOLOGY)**
SEMESTER	**1**
COURSE TITLE	**BIOCHEMISTRY**
COURSE CODE	**02MB0410**
COURSE CREDITS	**4**

Objective:

1 To provide students with a systematic approach of molecules of living systems and their biological functions and applications.

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

1 Understand and identify the biomolecules, their basic structure and composition.

2 Classify and characterize biomolecules and their subtypes based on their properties.

3 Examine and illustrate chemical reactions, biological interactions and analytical tools to study them.

4 Determine various biological functions and examine 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	**Carbohydrates** Classification, Types & Properties of Mono-, Oligo- and Polysaccharides, Physical, Chemical & Optical Properties of Sugars, Sugar Derivatives, Biological Functions & Applications, Estimation of Carbohydrates.	12
2	**Amino Acids & Proteins** Classification,Structural Features, Chemical Reactions & Properties of Amino Acids, Proteins, Peptide linkage, Protein Folding, Primary, Secondary, Tertiary, Quaternary structures of Proteins, Protein Motifs & Domains,Structural Classification of Proteins, Proteins Modifications, Biological functions, Applications;Protein Detection& Estimation.	15

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Contents : Unit	Topics	Contact Hours
3	**Nucleic acids and Lipids** Classification &Structural Features,Nitrogenousbases, Nucleosides, Nucleotides;Phospho-diester linkages; Pairing of Bases;Structure of DNA (A, B and Z forms) andRNA(tRNA, rRNA, mRNA, siRNA, microRNA), Biological Functions, Applications; Estimation& Detection of Nucleic Acids; Nucleic acid Sequencing & Synthesis., Classification, Structural Features & Types of Lipids& Fatty Acids, (Saturated,Unsaturated, Branched, Nomenclature, System Structure and Triglycerides,Phospholipids, Sphingolipids, Terpenes, Prostaglandins, Waxes, Steroids)Biological Functions, Applications; Detection and Estimation of Lipids.	18
4	**Vitamins and Hormones** Classification & Types: Fat soluble and Water solubleand Function of Vitamins., Classification and types of Hormones: Steroid and Peptide hormones; Functions and Properties, Deficiency disorder.	15
Total Hours		**60**

Textbook :

1 Lehninger's Principles of Biochemistry, 6th edition, David L. Nelson and Michael M. Cox; W. H. Freeman.1. David L. Nelson and Michael M., Cox; W. H. Freeman., 2013

2 Biochemistry 4th Edition, U. Satyanarayana, Elsevier, 2013

References:

1 Fundamentals of Biochemistry 5th Edition, Fundamentals of Biochemistry 5th Edition, Donald Voet, Judith G. Voe, 2.W. Pratt; Wiley publishers., 2016

2 Physical biochemistry: Principles and applications 2nd Edition, Physical biochemistry: Principles and applications 2nd Edition, David Sheeham, John Wiley and Sons, 2009

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
10.00	20.00	25.00	25.00	10.00	10.00

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.

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Instructional Method:

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.

3 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1 https://onlinecourses.nptel.ac.in/noc22_cy06/preview

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