INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**4**
COURSE TITLE	**BASIC BIOCHEMISTRY**
COURSE CODE	**02MB0253**
COURSE CREDITS	**6**

Objective:

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

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:to understand the basics of biochemistry

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
5	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Basics of Chemistry** Atoms, Ions, Molecules, Chemical Bonds, Properties of Water, Solvent & Solute, Types ofBiochemical Reactions, Acid-Base, Buffer, Basic of Thermodynamics.	
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 (Circular & Linear), Structure & Functions of RNA (t-RNA, r-RNA, and m-RNA); central dogma of life	
3	**Amino Acids & Proteins** Basic Structure, Classifications and Properties of Amino acids; Peptide bonds; Structural organization of Proteins; Functions & Applications	

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Contents : Unit	Topics	Contact Hours
4	**Lipids & Vitamins** Introduction of Lipids; Structure, classification (saturated, unsaturated, branched) & properties of fatty acids; Classification of Lipid (Simple, Complex & Derived), Functions and Applications of Lipids, Sources, Structure and biological function of vitamins.	
Total Hours		

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Experiment** Experiment 1, Experiment 2, Experiment 3, Experiment 4, Experiment 5, Experiment 6, Experiment 7	
Total Hours		

Textbook :

1 Fundamentals of Biochemistry, H.P.GAJERA, International Book Distributing Co. , 2008

2 Textbook of Basic Biochemistry, G. Durai Muthu Mani, Ryan Publishers, 2017

References:

1 Biochemistry, Biochemistry, U. Satyanarayana, Elsevier, 2013

2 Lehninger Principles of Biochemistry, Lehninger Principles of Biochemistry, David L. Nelson and Michael M. Cox, WH Freeman, 2017

3 Fundamentals of Biochemistry, Fundamentals of Biochemistry, Donald Voet, Judith G. Voet, Wiley, 2016

4 Physical biochemistry: Principles and applications, Physical biochemistry: Principles and applications, David Sheeham, John Wiley and Sons, 2009

5 Physical biochemistry: Applications to Biochemistry & Molecular Biology, Physical biochemistry: Applications to Biochemistry & Molecular Biology, David Freifelder, W. H. Freeman, 1982

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**
20.00	30.00	25.00	15.00	10.00	0.00

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

Supplementary Resources:

1. https://youtu.be/TX6BYceUSL0
2. https://youtu.be/z5Vm56Pu4hU
3. https://youtu.be/U_W-Ee3h12o
4. https://youtu.be/LJmFbcaxDPE
5. https://www.slideshare.net/DrUJWALKUMARTRIVEDI/fundamentals-of-atoms-molecules-and-ions
6. https://www.slideshare.net/DrUJWALKUMARTRIVEDI/chemical-bonds-158136813
7. https://youtu.be/D5RdWVBAN1c
8. https://youtu.be/ECKrQu0Y2PI
9. https://youtu.be/e0ijBDroE48

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