



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Science College
Semester-I (M.Sc.)

Subject: Biochemistry- MSCMB11502

Type of course: Major

Prerequisite: To provide students the knowledge and skills to understand the chemical processes that occur in living organisms.

Rationale: By understanding the principles of biochemistry, students can gain a deeper understanding of how life around the world works.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	0	4	60	30	10	00	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.



Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Presentation Faculty will assign topics and students will prepare presentations (Slideshow/video) and upload them to Moodle.	10
2	Assignment Faculty will assign a particular topic to students and students have to write it and upload it to Moodle.	10
3	Quiz Faculty will conduct quiz sessions in the classroom per unit of their respective subject and marks will be uploaded to the Moodle.	10
4	Paper Review Faculty will provide a particular portion of the research paper and a group of students will review it and prepare a conclusion in 100 words and upload it to Moodle.	10
5	MCQ Test Faculty will provide the students a set of MCQs according to the learning objective of the course and students will answer it individually on Moodle.	10
Total		50



Course Content:

Unit No	Course content	Hrs	% Weightage
1	Chapter:1-Biochemistry of Carbohydrates and Lipids <ul style="list-style-type: none"> • Carbohydrates, types, structure and function • Lipids: Fatty acids, simple lipids, phospholipids, and cholesterol • Glycoconjugates- glycoproteins, proteoglycans, and glycolipids • Central metabolic pathways, feeder pathways and Fate of pyruvate under anaerobic condition • PHA and PHB in cells; degradation of fatty acids by beta-oxidation. 	15	25
2	Chapter:2- Biochemistry of Proteins and Nucleic acids <ul style="list-style-type: none"> • Amino acids and proteins, structure, classification and properties • Structure and function of Nucleic acids, Nucleotides- types, derivatives and functions. • Nitrogen metabolism: Nitrate and Ammonia Assimilation, Nitrogen fixation and Nitrogenase • Biosynthesis and regulation of amino acids • Biosynthesis and regulation of nucleotides 	15	25
3	Chapter:3-Vitamins and Hormones: <ul style="list-style-type: none"> • Vitamins: Classification, chemistry and function, type of vitamins • Hormones: Chemistry, mode of action and function of plant and animal hormones. 	15	25
4	Chapter:4- Enzymology: <ul style="list-style-type: none"> • Apoenzyme, coenzyme and prosthetic groups. • Properties, classification, functions and mode of action of enzymes and coenzymes. • Isozymes, Abzymes and Ribozymes. • Protein folding and denaturation • Enzyme Kinetics • Enzyme regulation • Enzyme inhibition • Enzyme turnover • Immobilisation of Enzymes • Biotechnological applications of enzymes 	15	25

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20	40	30	10	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Identify the biological importance of biomolecules-carbohydrates and lipids.
CO2	Understand biochemistry of proteins and nucleic acid.
CO3	Pursue knowledge of biological metabolism of hormones and vitamins.
CO4	Pursue knowledge on working of enzyme along with its kinetic study

Instructional Method:

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

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

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.



Reference Books:

- 1) Biochemistry by Lehninger, Nelson, Cox
- 2) Principles and Techniques of Biochemistry and Molecular Biology (6th edition) by Keith Wilson and John Walker.
- 3) Biochemistry by Stryer.

