

**ORIENTAL COLLEGE (AUTONOMOUS), TAKYEL,  
IMPHAL  
TEACHING PLAN  
(B.A/B.Sc.)**

**Name of Department: Zoology  
Semester 3<sup>rd</sup> Semester 2023-24.**

**Paper Name: FUNDAMENTALS OF BIOCHEMISTRY Code: HC-603**

<b>No. of Hours per Week</b>	<b>Credits</b>	<b>Total No. of Hours</b>	<b>Marks</b>
4	4	60	75

**Course objectives:**

Ability to understand basic principles of chemistry to biological systems and molecular biology.  
To acquaint the students with the structure, chemical properties and biological significance of macromolecules of physiological importance.

**Learning outcomes:**

Understand the principles of various fields of chemistry and biology (organic chemistry, analytical chemistry, biochemistry, genetics, metabolism, and molecular biology).

Apply modern instrumentation theory and practice to biochemical problems.

On completion of the course the student should be able to know mechanism of body functions and the basic knowledge of chemistry of biomolecule.

<b>ZOO-HC-603: FUNDAMENTALS OF BIOCHEMISTRY</b>						
<b>Unit</b>	<b>Section</b>	<b>Topic</b>	<b>Hours</b>	<b>Learning outcome/ CO addressed</b>	<b>Pedagogy</b>	<b>Assessment</b>
<b>1</b>	<b>Carbohydrates</b>					
	1.	Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates	8	Studied the different types carbohydrates and their structure	Lecture, PPT.	MCQ, Short answer, Assignment
<b>2</b>	<b>Lipids</b>					
	1	Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Tri-acylglycerols, Phospholipids, Glycolipids, Steroids	8	Learnt about the structure, different types of lipids and fatty acids	Lecture, PPT	Objective type questions, Short answer, Assignment
<b>3</b>	<b>Proteins</b>					
	1	Amino acids: Structure, Classification and General properties of $\alpha$ -amino acids; Physiological importance of essential and non-essential $\alpha$ -amino acids	6	Explored the structure of amino acid; importance of essential and non-essential amino acid	PPT, Lecture	MCQ, Oral test, Assignment
	2	Proteins : Bonds stabilizing protein	6	Studies how the different communities change		

		structure; Levels of organization in proteins; Denaturation; Introduction to simple and conjugate proteins.		overtime		
	3	Immunoglobulins : Basic Structure, Classes and Function, Antigenic Determinants.	4	Explained how the climax community come into existence.		
<b>4</b>	<b>Nucleic acids</b>					
	1	Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Cot Curves	7	Explored the nitrogenous base nucleotide, nucleoside, nucleic acid	PPT, Lecture, Diagram	Objective test, Classroom interaction, Short answer
	2	Base pairing, Denaturation and Renaturation	5	Learnt different aspects of DNA and RNA-denaturation and re-naturation etc.		
<b>5</b>	<b>Enzymes</b>					
	1	Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action	6	Recall classification of enzymes. Taught how the enzymes act on substrate.	Lecture, PPT	MCQ, Short answer, Assignment
	2	Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Derivation of Michaelis-Menten equation, Concept of Km and Vmax, Lineweaver-Burk plot	6	Studied different equations related with enzymes action.		
	3	Multi-substrate reactions; Enzyme inhibition; Allosteric	4	Learnt about enzyme inhibition and concept of Allosteric enzyme.		

		enzymes and their kinetics; Regulation of enzyme action				
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### **SUGGESTED READING**

- **Cox, M.M and Nelson, D.L. (2008). Lehninger's Principles of Biochemistry, V Edition, W.H. Freeman and Co., New York.**
- **Berg, J.M., Tymoczko, J.L. and Stryer, L. (2007). Biochemistry, VI Edition, W.H. Freeman and Co., New York.**
- **Murray, R.K., Bender, D.A., Botham, K.M., Kennelly, P.J., Rodwell, V.W. and Well, P.A. (2009). Harper's Illustrated Biochemistry, XXVIII Edition, International Edition, The McGraw- Hill Companies Inc.**
- **Hames, B.D. and Hooper, N.M. (2000). Instant Notes in Biochemistry, II Edition, BIOS Scientific Publishers Ltd., U.K.**
- **Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M. and Losick, R. (2008). Molecular Biology of the Gene, VI Edition, Cold Spring Harbor Lab. Press, Pearson Pub.**

**Name of teachers :**

- 1) Prof. R. K. Rajeshwari Devi**
- 2) K. Uma Devi**
- 3) Dr. L. Chitra Devi**
- 4) Dr. H. Binota Devi**