ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A++ 'Grade by NAAC(CGPA:3.58/4.00)
College with Potential for Excellence by UGC
DST-FIST Supported & STAR College Scheme by DBT

Syllabus of Theory

Part A – Introduction			
Program: Certificate Course	Class: B.Sc.	Semester: I	Session: 2025-2026
Subject: ZOOLOGY			
1	Course Code		
2	Course Title	Fundamentals of Biochemistry	
3	Course Type	Minor I	
4	Prerequisite	To study this course student should have subject Biology in class 12th	
5	Course Learning Outcomes (CLO)	Upon completion of the course students will be able to 1. Understand Importance of Biochemistry in Indian knowledge. System and five elements and balancing of three doshas. 2. Learn about structure of water and biomolecules 3. General structure and classification of Carbohydrate, Proteins and Lipids 4. Signification of Biomolecules. 5. Learn about enzymes, their classification and characteristics. 6. Vitamins and their importance. 7. Job prospect: Lab technician Pharmaceuticals, Pathology Lab.	
6	Credit Value	4	
7	Total Marks	Max.Marks:30+70	Min. Passing Marks: 35

Part B - Content of the course LTP:
Total Number of Lectures:30

Unit	Topics	No. Of Lectures
I	**Ancient Historical Background of Biochemistry Definition of Biochemistry and Water.** 1. Definition, Importance of Biochemistry in Indian knowledge system. 2. Ayurvedic Principles: Balancing the three doshas (Vata, Pitta, Kapha) to 3. maintain homeostasis. 4. Panchabhuta: Biochemical properties of five elements (Earth, water, Fire, Air and Ether) 5. Water: 5.1. Structure of water molecule 5.2. pH and buffers: pH scale, weak acids and weak bases. **Key words:** Ayurveda, Panchabhuta, Homeostasis, pH, Buffers **Suggested Activity:** Draw and display three-dimensional structure of water, make model of water bodies in and around your area.	7
II	**Biomolecules** 1. Carbohydrate 1.1. General structure of Carbohydrates 1.2. Classification of Carbohydrates 1.3. Optical Isomerism 1.4. Physical and chemical properties of Carbohydrates 2. Proteins: 2.1. General structure of Proteins (Primary, Secondary, tertiary and Quaternary) 2.2. Classification of Proteins (an overview) 2.3. Physical and chemical properties of Proteins. **Key words:** Monosaccharides, Isomerism, Proteins, Carbohydrates. **Suggested Activity:** Make a chart of classification of Carbohydrates and Proteins with examples.	8

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III	**Biomolecules** 1. Lipids 1.1. General structure of lipids 1.2. Classification of lipids: (i) Simple lipids: Fats, Oil and Waxes. (ii) Compound lipids: Phospholipids, Glycolipids (iii)Derived lipids: Steroids 2. Physical properties of lipids: Colour, odours solubility and surfaces tension. 3. Chemical properties of lipids: Hydrolysis, saponification, rancidity and hydrogenation. **Key words**: Lipids, Hydrolysis, Saponification, Rancidity, Hydrogenation **Suggested Activity**: Submit an assignment on properties of lipids.	8
IV	**Enzymes and Vitamins.** 1. Nomenclature of Enzymes. 2. Classification of Enzymes 3. Characteristics of Enzymes: Colloidal nature, Catalytic nature, Specificity & pH 4. Enzymes subtract complex: Key-Lock Theory, Induced Fit Theory 5. Importance of Enzymes in Metabolism. 6. Vitamins: Biochemical functions, dietary sources and deficiency symptoms. **Key words**: Enzymes, Catalytic, Specificity, Vitamins **Suggested Activity**: Make a flow- chart of dietary sources and deficiency symptoms of vitamins.	7

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Part C-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks :100

Continuous Comprehensive Evaluation (CCE: 30 Marks University Exam (UE): 70 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	30
External Assessment: University Exam Section Time: 03.00 Hours	**Section(A):** Very Short Questions **Section (B):** Short Questions **Section (C):** Long Questions	70

Any remarks/ suggestions:

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Syllabus of Practical

Part A – Introduction			
Program: Certificate course.	Class: B.Sc.	Semester : I	Session: 2025-2026
Subject: ZOOLOGY			

1	Course Code		
2	Course Title	Fundamentals or Biochemistry.	
3	Course Type	Minor I	
4	Prerequisite	To study this course a student must have had the subject Biology in 12th Class.	
5	Course Learning Outcomes (CLO)	The student who completes this course will be able to- 1. Learn lab safety rules 2. Prepare distilled water 3. Prepare biochemical reagents 4. Prepared of Buffers 5. Perform qualitative tests for carbohydrate protein and lipids. 6. Steady activities of enzymes. 7. Job Prospects: Lab Technician, Work in any Pharmaceutical Company, Pursue career as Biochemist	
6	Credit Value	02	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks: 35

Part B - Content of the course Total No. Of Lectures-Tutorials-Practical (2 hours per week) LTP: Total Number of Lectures:30		
S. No.	**Suggested list of experiment.**	**No of Lecture**
1	Introduction to Biochemistry Lab, Safety aspects in laboratory (Lab rules)	5
2	Preparation of distilled water in laboratory	5
3	Biochemical reagent preparations for various solution with respect to different Normality, molarity, o/o solution (W/V), (V/V)	5
4	Preparation of buffers and its pH determination.	5
5	Quantitative tests for Carbohydrate, Protein and Lipids	5
6	Study activities of any enzymes under optimum condition.	5
	Total	30 hours
	Key words: Distilled water, Normality, Molarity	

Part -C: Assessment & Evaluation (Practical)

Suggested Continuous Evaluation Methods:

	Internal Assessment	Marks	External Assessment	Marks
1	Class Interaction/Quiz	30	Viva Voce on Practical	70
2	Attendance		Practical Record File	
3	Assignments (Charts/Model Seminar/Rural Service /Technology Dissemination/ Report of Excursion /Lab Visit/Survey/ Industrial visit)		Table work/Experiments	
	Total	**30**		**70**

Any remarks/Suggestions: e- Demonstrations & e- procedures can be opted.

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