



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि. नर्मदा Rajpipla, Dist. Narmada
Established by Tribal Development Department, Govt. of Gujarat

School of Science
B.Sc. (Chemistry) Programme
Subject Code & Name: - BS02MDCHE2 Bio-Chemistry

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
L	T	P	Total	CCE		SEE	
				TH	PWE	TH	PWE
3	-	1	4	37.5 %	12.5 %	37.5 %	12.5 %

Programme Name	B.Sc. (Chemistry)
Semester	II
Course Code	BS02MDCHE2
Course Title	Bio-Chemistry
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	3+1
Sessions+ Lab. Per Week	3 + 2
Total Teaching/Lab. Hours	45 Theory Hours + 30 Practical Hours
* 2 Laboratory = 1 Session	

Learning Objectives

The course aims to provide student with an understanding of biomolecules such as proteins and carbohydrates focusing on their structural underpinning, unique properties, biological roles and functions and interrelations.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Acquainted with chemical a molecular foundations of life and appreciate the role of water in biological system.
2. Able to comprehend the structure, function and acid-base properties of amino acids.
3. Explain the hierarchical structure of structure proteins and their biological significance.
4. Explain the structures and properties of carbohydrates.





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Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Foundation of Biochemistry <ul style="list-style-type: none">• Properties and structure of water molecule.• pH, pH scale and Buffers (Phosphate and Citrate buffer). Introduction and Classification of Carbohydrates: <ul style="list-style-type: none">• Sources and nutritive values of Carbohydrates.• Monosaccharides: Aldoses and ketoses, trioses, tetroses, pentoses and hexoses.• Stereoisomerism of Monosaccharides.• Disaccharides: Maltose, Lactose and Sucrose.• Polysaccharides: Starch and Glycogen.• Structural polysaccharides: Cellulose and chitin.	15
II	Introduction and Classification of Proteins: <ul style="list-style-type: none">• Sources and nutritive values of Proteins.• Properties of proteins.• Classification of proteins: Simple proteins, Compound proteins and Derived proteins.• Biological functions of proteins.• Configuration of Proteins with their examples: Primary, Secondary, Tertiary and Quaternary.• Properties and structure of Amino acids.• Classification of Amino acids.	15
III	Introduction and Classification of Lipids: <ul style="list-style-type: none">• Sources and nutritive values of Lipids.• Properties of Lipids.• Classification of Lipids: Simple Lipids, Compound Lipids and Derived Lipids.• Structure and classification of fatty acids.• Biological functions of Lipids.	15





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Unit – IV Practical(s)	30 Hours
<ol style="list-style-type: none">1. Preparation of buffers, phosphate and acetate buffers.2. Determination of pKa of acetic acid.3. Qualitative tests for carbohydrates.4. Qualitative tests for amino acids.5. Estimation of amino acid by Ninhydrin method.6. Separation of amino acid mixture by thin layer chromatography/paper chromatography.7. Estimation of vitamin C from lemon fruits.	
Text Book(s)	
<ol style="list-style-type: none">1. Elementary Biochemistry by Jain and Jain.2. Biochemistry by U. Satyanarayana and U. Chakrapani.	
Reference Books	
<ol style="list-style-type: none">1. Lehninger: Principles of Biochemistry by D.L Nelson, Lehninger A.L. and Cox M.M.2. Biochemistry by Berg J. M. Tymoczko J. L. and L. Stryer.3. Biochemistry by Voet & Voet.	

L:: Lecture, **T::** Tutorial , **P::**Practical

CCE::Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/ surprised), attendance etc. or any combination of these)

PWE::Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

SEE::Semester End Evaluation

