

Generic Elective Courses

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)

Department of Biochemistry

Course Curriculum

PART- A: Introduction			
Program: Bachelor in Science (Certificate / Diploma / Degree/Honors)		Semester - I	Session: 2024-2025
1	Course Code	BCGE - 01 T	
2	Course Title	Introductory Biochemistry and Biomolecules	
3	Course Type	Generic Elective (Theory)	
4	Pre-requisite (if, any)	As per program	
5	Course Learning Outcomes (CLO)	<p><i>After completion of the course, the students would be able:</i></p> <ul style="list-style-type: none"> ➤ Students will be exposed to the history of Biochemistry and key contributions of scientists. ➤ Understand the properties of carbohydrates, proteins, lipids, cholesterol, DNA, RNA and their importance in biological systems. ➤ Understand the methods of determination of amino acid and nucleotide sequence of proteins and DNA respectively. ➤ They will understand the methods of estimation of DNA & RNA 	
6	Credit Value	3 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics (Course contents)		No. of Period
I	General understanding of Biochemical Molecular Logic of Life. Definition. Experiments and discoveries of Acharya Nagarjuna. Famous Indian and foreign Biochemists and their inventions/ Discoveries. Importance of Yog, Pranayam, food and healthy lifestyle for balance of biochemical (kaf, vat, pitta) of our body and role in maintaining good mental and physical health. Biochemical basis of Lifestyle disorders.		09
II	Structure and functions of Carbohydrates and lipids: Definition, classification, biological importance. Monosaccharides: Disaccharides: Establishment of structures of sucrose and lactose and maltose. Polysaccharides: Partial structure, occurrence and importance of starch, glycogen, inulin, cellulose, chitine. heparin, hyaluronic acid. Lipids: Classification and biological role. Fatty acids – Nomenclature of saturated and unsaturated fatty acids. Phosphoglycerides: function of lecithin, cephalins, phosphotidylinosital, plasmalogens, and cardiolipin, importance of sphingomyelin, gangliosides and cerebrosides.		12
III	Structure and functions of Amino acids and Proteins: General Structure, classification of amino acids based on R Group. Amino acids D & L notation. Proteins: Peptides, Primary Structure of proteins, N- and C- terminal amino acids, Secondary Structure – α Helix. β -sheet, β -bend. Tertiary and quaternary structure, denaturation and renaturation of proteins.		12
IV	Structure and functions of Nucleic acids: Composition of DNA and RNA. Nucleosides and nucleotides. Chargaff's rule. Primary and secondary structure of DNA, Watson and Crick model of DNA. Melting of DNA (Tm).		12
Keywords	Biomolecules, Carbohydrate, Lipids, Fatty acids, Nucleotides, Nucleosides, Nucleic acids,		

Name and Signature of Convener & Members of CBoS:

PART-C: Learning Resources**Text Books, Reference Books and Others****Text Books Recommended –**

- Nelson, Cox and Lehninger Principles of Biochemistry, 7th Edition
- Medical Biochemistry By Styanarayan.

Online Resources–

- **e-Resources / e-books and e-learning portals**
- <https://www.britannica.com/>
- <https://en.wikibooks.org/wiki/Biochemistry>
- <https://www.pdfdrive.com/biomolecules-books.html>
- <https://byjus.com/biology/biomolecules/>
- <https://www.vedantu.com/biology/biomolecules>

PART -D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:****Maximum Marks: 100 Marks****Continuous Internal Assessment (CIA): 30 Marks****End Semester Exam (ESE): 70 Marks**

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit- 4x10=40 Marks	

 
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PART- A: Introduction			
Program: Bachelor in Science <i>(Certificate / Diploma / Degree / Honors)</i>		Semester - I	Session: 2024-2025
1	Course Code	BCGE – 01 P	
2	Course Title	Biomolecules	
3	Course Type	Generic Elective (Practical)	
4	Pre-requisite (if, any)	As per the Course	
5	Course Learning Outcomes (CLO)	<p><i>On successful completion of the course, the student shall be able to:</i></p> <ul style="list-style-type: none"> ➤ Describe the basic lab requirements and their uses. ➤ Explain various instruments using in separation and isolation of various analytical compounds. ➤ Analyze the characteristics of the compound on the basis of their pH. ➤ Understand to Prepare normal, molar and stock solution. ➤ To estimate Biomolecules in mixture. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field learning/Training</i>
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART -B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course	<ul style="list-style-type: none"> ➤ Safety measures in laboratories. ➤ Preparation of normal, molar and stock solution. ➤ Preparation of buffers. ➤ Qualitative tests for carbohydrates, lipids, amino acids, proteins and nucleic acids. ➤ Short write-ups on disease privations practices in Indian Knowledge system. 		30
Keywords	<i>Laboratory Safety, Estimation, Sugar, Fat, Proteins</i>		

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PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended –		
<ul style="list-style-type: none"> ➤ Lehninger: Principles of Biochemistry (2013) 6th ed., Nelson, D.L. and Cox, ➤ Experimental Biochemistry by Beedu Shashidhar Rao 		
Online Resources–		
<ul style="list-style-type: none"> ➤ e-Resources / e-books and e-learning portals ➤ https://en.wikibooks.org/wiki/Biochemistry ➤ https://www.pdfdrive.com/biomolecules-books.html ➤ https://ncert.nic.in/textbook.php 		
PART -D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment (CIA): 15 Marks		
End Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

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