CHAUDHARY RANBIR SINGH UNIVERSITY, JIND

Undergraduate Programs

Course: SEC-2

Session 2024-25			
Part A – Introduction			
Subject	**Biotechnology**		
Semester	**II**		
Name of the course	**Biochemical Analysis**		
Course Code	**B24-BTY-207**		
Course Type: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC)	**SEC-2**		
Level of the course (As per Annexure-I	**200-299**		
Pre-requisite for the course (if any)	**NA**		
Course Learning Outcomes(CLO):	After completing this course the students will: 1. Master essential laboratory techniques such as handling equipment, sterilizing glassware, and operating instruments. 2. Learn estimating sugars, lipids, and proteins through various analytical methods. 3. Also equip them with practical clinical skills, enabling them to conduct blood typing, differential leukocyte counts, and diagnose diseases. 4. Explore the fascinating field of genetic techniques, learning to extract and analyze DNA using electrophoresis and gel filtration.		
Credits	Theory	Practical	Total
	0	3	3
Contact Hours	0	6	6
Practical			
Max Marks: 75 **Internal Assessment Marks: 25** **End Term Exam Marks: 50**	**Time : 3 Hours**		

Part B- Contents of the Course		
Units	**Topics**	**Contact Hours**
Practical	Practicum: 1. Safety measures in laboratory 2. Cleaning and sterilization of glassware 3. Study of instruments: Hot air oven, pH meter, Weighing balance, spectrophotometer, and centrifuge	90

	4. Estimation of reducing and non-reducing sugars 5. Separation of sugars by Paper Chromatography 6. Separation of Lipids by TLC method 7. Determination of saponification and iodine value of Lipids 8. Starch hydrolysis by salivary amylase 9. Estimation of Vit. C. 10. Gel Filtration chromatography/Ion Exchange Chromatography 11. ABO blood grouping and Rh typing. 12. Differential leukocyte count. 13. RBC counting using a haemocytometer. 14. WBC counting using a haemocytometer. 15. Dot ELISA. 16. Diagnosis of infectious disease – Widal test 17. Isolation and quantification of genomic DNA from bacteria (E. coli), animals or plants. 18. Absorption spectra of proteins and nucleic acids. 19. Analysis of DNA by Agarose Gel Electrophoresis. 20. Extraction and estimation of proteins from plant or animal source	

Suggested Evaluation Methods

Internal Assessment: ➢ Practicum (25 Marks) • Class Participation:10 • Seminar/Demonstration/Viva-voce/Lab records etc.: 15 Marks • Mid-Term Exam: Nil	**End Term Examinations** 50 Marks

Part C-Learning Resources

Recommended Books/e-resources/LMS:

- Principles of Biochemistry by Nelson and Cox
- Lehninger Principles of Biochemistry by Nelson, Cox, and Lehninger
- Practical Biochemistry by David E. Metzler
- Laboratory Techniques in Biochemistry and Molecular Biology by R. H. Burdon and G. W. Foster
- Biochemistry Laboratory Manual by Thomas R. Farrell and Margaret F. Farrell
- Clinical Biochemistry: Principles and Techniques by Alan L. Babson and Richard C. Bowers
- Molecular Biology Techniques: A Laboratory Manual by Sambrook, Fritsch, and Maniatis
- Immunochemical Techniques for the Identification and Quantitation of Macromolecules by Peter H. Petra and John R. Kuhar
- Biochemistry Laboratory Experiments: A Comprehensive Guide by Roger E. Koeppe II and William J. Nelson
- Fundamentals of Clinical Chemistry by David E. Metzler and Carter C. Nelson