Course Code	Course Name	Credits
26ZY108	BIOTECHNICS	04

Course Objectives

- To understand the principles and applications of biotechnics.
- To study biological techniques used in zoological research.
- To develop knowledge on laboratory instruments and methods.
- To understand microscopy, staining and culture techniques.
- To enhance practical skills in biological experimentation.

Learning Outcomes

- Explain the importance of biotechnical methods in biology.
- Identify laboratory instruments and their applications.
- Demonstrate microscopy and staining techniques.
- Analyze biological samples using laboratory methods.
- Apply biotechnical skills in research and diagnostics.

Unit 1 - Introduction to Biotechnics (12 Hrs.)

Definition, scope and importance of biotechnics; laboratory safety measures; sterilization techniques; preparation of laboratory reagents and solutions.

Unit 2 - Microscopy and Imaging Techniques (12 Hrs.)

Principles and types of microscopes; light, phase contrast and electron microscopy; specimen preparation; photomicrography and imaging techniques.

Unit 3 - Histological and Cytological Techniques (12 Hrs.)

Fixation, dehydration and embedding; microtomy; staining techniques; preparation of permanent slides; cytological methods.

Unit 4 - Biochemical and Molecular Techniques (12 Hrs.)

Chromatography, electrophoresis and centrifugation; PCR and DNA isolation; spectrophotometry; immunological techniques.

Unit 5 - Culture Techniques and Applications (12 Hrs.)

Cell and tissue culture techniques; microbial culture methods; experimental animal handling; applications of biotechnics in research, medicine and biotechnology.

Reference Books:

1. Pearse, A.G.E. (2017). Histochemistry: Theoretical and Applied. Churchill Livingstone.
2. Bancroft, J.D. and Gamble, M. (2019). Theory and Practice of Histological Techniques. Elsevier.
3. Wilson, K. and Walker, J. (2020). Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press.
4. Karp, G. (2018). Cell and Molecular Biology: Concepts and Experiments. Wiley.
5. Plummer, D.T. (2016). An Introduction to Practical Biochemistry. McGraw Hill.

Websites and eLearning Sources:

1. https://www.ncbi.nlm.nih.gov/
2. https://www.biologydiscussion.com/
3. https://www.easybiologyclass.com/