

SYLLABUS

of the

Value-added Course

Animal Biotechnology (ZOOVAC 001)

(w.e.f. 2022-2023)



Offered by:

THE DEPARTMENT OF Zoology
Panskura Banamali College
(AUTONOMOUS)

Panskura R.S., PurbaMedinipur
West Bengal – 721152

COURSE INFORMATION IN BRIEF

Course Name:	<i>Animal Biotechnology</i>
Course Contents:	Course layout, rules & regulations
Course Type:	Value-added Course (Optional, additional, and not a part of the CBCS curriculum)
Medium:	Bengali, English
Mode:	Offline/Online
Intake:	Minimum 20; Maximum 40
Eligibility:	+XII, Any interested candidate in Zoology Dept.
Duration:	30 hours (to complete within a time span of 2 months)
Course Fees:	Rs. 300
Coordinator:	Mr. Subratakumar Payra
Contact:	Department of Zoology ,Panskura Banamali College (Autonomous) abhisheksamanta1234@gmail.com 9830986390 (WhatsApp only)

Course Learning Objective:

Biotechnology is the advanced branch of biological sciences which mostly deals with technological application on biological systems. It is basically the management of biological processes for industrial and other human welfare purposes. The present paper on biotechnology attempts to give a wholesome idea of biotechnology at a basic level. It provides a tool kit in the form of a number of various techniques and processes developed over time to solve problems involving primarily human welfare with focus on health and medicine. It will equip the students with basic tools of biotechnology which are a must for everyone interested in pursuing a career in biotechnology. It makes one aware of the scope of this field which encompasses almost every field of science like engineering, research, commercialization and academics.

Course Learning Outcome:

Upon completion of the course, students should be able to:

- Use or demonstrate the basic techniques of biotechnology like DNA isolation, PCR, transformation, restriction digestion etc.
- Make a strategy to manipulate genetic structure of an organism for the improvement in any trait or its well-being based on the techniques learned during this course.
- Understand better the ethical and social issues regarding GMOs.

Course Content:

Theory

Unit 1: Introduction

Concept and scope of biotechnology

Unit 2: Basic Tools for Gene Manipulation

Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, M13, BAC, YAC, MAC and Expression vectors (characteristics). Restriction enzymes: Nomenclature, detailed study of Type II, Construction of genomic and cDNA libraries

Unit 3: Advance Tools and Techniques

Southern, Northern and Western blotting DNA sequencing: Sanger method, Polymerase Chain Reaction, DNA Finger Printing and DNA micro array,

Unit 4: Genetically Modified Organisms

Production of cloned and transgenic animals;
DNAMicroinjection; Applications of transgenic animals: Production of pharmaceuticals,
knock out mice. Production of transgenic plants: Agrobacterium-mediated transformation.
Applications of transgenic plants: insect and herbicide resistant plants.

Reference-1.(Chapter 1: Glick, B.R., Pasternak, J.J. and Patten, C.L.)

2.(Chapter 3: Glick, B.R., Pasternak, J.J. and Patten, C.L.; Chapter 2, 4, 6, 7 and 8:

3.(Chapter : Glick, B.R., Pasternak, J.J. and Patten, C.L Chapter 9, 10 and 16, Brown, T.A.)

4.(Chapter 9, 16, 18, 19 and 21: Glick, B.R., Pasternak, J.J. and Patten, C.L;

Practical [Credits: 1]

10hrs

1. Genomic DNA isolation from *any organism*
2. Plasmid DNA isolation (pUC 18/19) from *E.coli*
3. Demonstration of Restriction digestion of Plasmid/Lambda DNA.
4. Construction of circular and linear restriction map from the data provided.

