

**DISCIPLINE CENTRIC ELECTIVE COURSES  
DSE 1****ANIMAL BIOTECHNOLOGY**

THEORY

(Credits 4)

**Unit 1****Introduction**

- 1.1 Concept and scope of biotechnology
- 1.2 Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, and Expression vectors (characteristics)
- 1.3 Restriction enzymes: Nomenclature, detailed study of Type II.
- 1.4 Transformation techniques: Calcium chloride method and electroporation.

**Unit 2****Gene manipulation**


- 2.1 Construction of genomic and cDNA libraries and screening by colony and plaque hybridization
- 2.2 Southern, Northern and Western blotting
- 2.3 DNA sequencing: Sanger method
- 2.4 Polymerase Chain Reaction, DNA Finger Printing and DNA micro array

**Unit 3****Genetically Modified Organisms**

- 3.1 Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection
- 3.2 Transgenic animals (mice, cattle, sheep, goat, birds, fishes)
- 3.3 Applications of transgenic animals
- 3.4 Production of pharmaceuticals, production of donor organs, knockout mice.

**Unit 4****Culture Techniques and Applications**

- 4.1 Preparation of growth media
- 4.2 Microbial culture techniques and management
- 4.3 Molecular diagnosis of genetic diseases
- 4.4 Recombinant DNA in medicine (recombinant insulin and human growth hormone), gene therapy

  
Dr. Ulfat Jan  
Prof. & Head,  
P.G. Dept. of Zoology  
University Of Kashmir

SEM-IV

Zoology

ZO2E05E516.

**ANIMAL BIOTECHNOLOGY**


**PRACTICAL**

**(Credits 2)**

1. Restriction digestion of plasmid DNA.
2. To study following techniques through photographs
  - a) Southern Blotting
  - b) Northern Blotting
  - c) Western Blotting
  - d) DNA Sequencing (Sanger's Method)
  - e) PCR
  - f) DNA fingerprinting
3. Project report on animal cell culture

**SUGGESTED READINGS**

- Brown, T.A. (1998). *Molecular Biology Labfax II: Gene Cloning and DNA Analysis*. II Edition, Academic Press, California, USA.
- Glick, B.R. and Pasternak, J.J. (2009). *Molecular Biotechnology - Principles and Applications of Recombinant DNA*. IV Edition, ASM press, Washington, USA.
- Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). *An Introduction to Genetic Analysis*. IX Edition. Freeman and Co., N.Y., USA.
- Snustad, D.P. and Simmons, M.J. (2009). *Principles of Genetics*. V Edition, John Wiley and Sons Inc.
- Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). *Recombinant DNAGenes and Genomes- A Short Course*. III Edition, Freeman and Co., N.Y., USA.
- Beauchamp, T.I. and Childress, J.F. (2008). *Principles of Biomedical Ethics*. VI Edition, Oxford University Press.  
*CBCS Undergraduate Program in Zoology*

  
Dr. Jitendra Jan