B.Sc. Forensic Science: Semester-IV FST 405: Zoology- IV	
Teaching Scheme	**Examination Scheme**
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course outcomes:

The student at the completion of the course will be able to:

- Understand the principles of genetic engineering, how genes can be cloned in bacteria and the various technologies involved in it.
- Know the applications of biotechnology in various fields like agriculture, industry and human health.
- To have an in depth understanding about Immune System & its mechanisms.
- Get introduced to DNA testing and utility of genetic engineering in forensic sciences.
- Get introduced to computers and use of bioinformatics tools.
- Enable students to get employment in pathology/Hospital.
- Take up research in biological sciences.

Unit I – Principles of Gene Manipulation

- Recombinant DNA Technology
- Selection and identification of recombinant cells
- Restriction Enzymes, DNA modifying enzymes, Cloning Vectors, Ligation
- Gene transfer techniques, Gene therapy

Unit II – Applications of Genetic Engineering

- Single cell proteins
- Biosensors, Biochips
- Crop and livestock improvement, development of transgenics
- Development of DNA drugs and vaccines

Unit III – DNA Diagnostics

- Genetic analysis of human diseases, detection of known and unknown mutations
- Concept of pharmacogenomics and pharmacogenetics

Unit IV – Immune System and its Components

- Historical perspective of Immunology, Innate and Adaptive Immunity, clonal selection, complement system
- Structure and functions of different classes of immunoglobulins, Hypersensitivity
- Humoral immunity and cell mediated immunity
- HLA complex: organization, class I and II HLA molecules

Unit V – Biostatistics

- Calculations of mean, median, mode, variance, standard deviation
- Concepts of coefficient of variation, Skewness, Kurtosis
- Elementary idea of probability and application
- Data summarizing: frequency distribution, graphical presentation—bar, pie diagram, histogram
- Tests of significance: one and two sample tests, t-test and Chisquare test

Head
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Dean
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