

Zoology Course 4.02

CURRENT TRENDS IN ZOOLOGY

3 CREDITS

Objectives

- To understand the basic concepts of molecular biology.
- To understand the trends of biotechnology.
- To understand the basic concepts of biostatistics.

UNIT I: BASIC MOLECULAR BIOLOGY

(15 Lectures)

- **DNA Replication:**
Mechanism of replication in Prokaryotes and Eukaryotes
- **Transcription**
Transcription in Prokaryotes
Transcription in Eukaryotes
- **Translation**
Genetic code: Properties, features and Wobble hypothesis

Structure and Chemical composition of Prokaryotic and Eukaryotic ribosome.

Mechanism of Protein Synthesis: Aminoacylation of tRNA, Activation of tRNA and Recognition of tRNA

Stages of polypeptide synthesis in Prokaryotes: Initiation, Elongation and termination

Polysomes and Coupled Transcription

Translation: Stages of polypeptide synthesis in Eukaryotes: Initiation, Elongation and termination, Modification of Released protein.

UNIT II: ADVANCED BIOTECHNOLOGY

(15 Lectures)

- Recombinant DNA technology.
- Restriction enzymes
- Properties and types of vectors: Plasmid, pBR 322. Phage vector & Cosmid
- DNA cloning.
- Construction of DNA library: Gene library, c-DNA library.
- Southern blotting technique.
- DNA Sequencing: Maxam and Gilbert technique, Sanger's technique.
- Transgenic animals
- Proteins produced by gene manipulation: Insulin & Human growth hormone.
- Biohazards of recombinant DNA technology.

UNIT III: BIOSTATISTICS

(15 Lectures)

- Introduction to Biostatistics: Data collection and sampling techniques
- Descriptive statistics:
 - Descriptive statistical summaries – Mean, Mode, Median, Variance, Standard deviation
 - Graphic Representation – Histogram, Frequency polygon, Percentiles
- Random variable
- Discrete distribution
- Continuous distribution
- Coefficient of variance
- Measures of dispersion
- Hypothesis testing
- Regression and Correlation
- Z-test, t-test, *Chi* square test
- Theories of Probability

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