

B.Sc. Forensic Science: Semester-I	
FST106: Zoology-I	
Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
	Attendance – 12 Marks
Credits: 4	End Semester Exam – 70 marks

Course outcomes:

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

- Understand the structure and function of all the cell organelles.
- Know about the chromatin structure and its location.
- To be familiar with the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form new organisms.
- How one cell communicates with its neighboring cells?
- Understand the basic principles of genetics and how genes (earlier called factors) are inherited from one generation to another.
- Understand the Mendel's laws and the deviations from conventional patterns of inheritance.
- Comprehend how environment plays an important role by interacting with genetic factors.
- How to detect chromosomal aberrations in humans and study the pattern of inheritance by pedigree analysis in families.

Unit I – Structure and Function of Cell Organelles

- Plasma membrane: chemical structure—lipids and proteins
- Cell-cell interaction: cell adhesion molecules, cellular junctions
- Endomembrane system: protein targeting and sorting, endocytosis, exocytosis
- Cytoskeleton: microtubules, microfilaments, intermediate filaments
- Mitochondria: Structure, oxidative phosphorylation
- Peroxisome and ribosome: structure and function

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Unit II – Nucleus and Chromatin Structure

- Structure and function of nucleus in eukaryotes
- Chemical structure and base composition of DNA and RNA
- DNA supercoiling, chromatin organization, structure of chromosomes
- Types of DNA and RNA

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Unit III – Cell cycle, Cell Division and Cell Signaling

- Cell division: mitosis and meiosis
- Cell cycle and its regulation, apoptosis
- Signal transduction: intracellular signaling and cell surface receptors, via G-protein linked receptors, JAK-STAT pathway

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Unit IV – Mendelism and Sex Determination

- Basic principles of heredity: Mendel's laws, monohybrid and dihybrid crosses
- Complete and Incomplete Dominance
- Penetrance and expressivity
- Sex-linked characteristics and Dosage compensation

Unit V – Infectious Diseases

- Introduction to pathogenic organisms: viruses, bacteria, fungi, protozoa, and worms.
- Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of common parasites: *Trypanosoma*, *Giardia* and *Wuchereria*

Suggested Readings:

1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA (2004).
2. Alberts et al: Molecular Biology of the Cell: Garland (2002).
3. Cooper: Cell: A Molecular Approach: ASM Press (2000).
4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman (2004).
5. Lewin B. Genes VIII. Pearson (2004).
6. Watson et al. Molecular Biology of the Gene. Pearson (2004).
7. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis KubyKuby Immunology. W H Freeman (2007).
8. Delves Peter J., Martin Seamus J., Burton Dennis R., Roitt Ivan M. Roitt's Essential Immunology, 13th Edition. Wiley Blackwell (2017).
9. Shetty Nandini Immunology Introductory Textbook. New Age International. (2005)

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