



Semester - I

BRANCH	Subject Title	Subject Code
B.Sc. (Zoology – Minor/Generic Elective Course)	CELL BIOLOGY, REPRODUCTIVE BIOLOGY AND DEVELOPMENTAL BIOLOGY	ZOM2/ZO

Course learning outcomes (CLO)

1. Develop deeper understanding of what life is and how it functions at cellular level
2. Understand the nature and basic concepts of Cell biology, Reproductive and Developmental biology
3. Understand structure and functions of cell membrane and cellular organelles
4. Understand the importance of latest reproductive trends, reproductive techniques to be applied for human welfare.
5. Understand the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multi-cellular organisms.
6. Understand about the evolutionary development of various animals.

Unit - I

Cell Biology

- 1.1 Concept of Prokaryotic and Eukaryotic Cells, difference between Prokaryotic and Eukaryotic Cells
- 1.2 Structure and functions of Plasma membrane
- 1.3 Structure and functions of Golgi body, Mitochondria, Endoplasmic reticulum, Ribosome and Lysosome
- 1.4 Structure and functions of Nucleus
- 1.5 Structure and functions of Chromosome and special type of chromosomes-Lampbrush and Polytene chromosome
- 1.6 Cell cycle, Mitotic and Meiotic cell division and their significance



Unit - II

Reproductive Biology

- 1.1 Structure of Male reproductive system of Lepus
- 1.2 Structure of Female reproductive system of Lepus
- 1.3 Histology of Testis, and Ovary of Lepus
- 1.4 Gametogenesis- Spermatogenesis and oogenesis, difference between spermatogenesis and oogenesis
- 1.5 Types of Eggs-based on amount and distribution of yolk with examples

Unit - III

Recent Assisted Reproductive Techniques (ART)

- 1.1 Stem cell- Types and their uses
- 1.2 Gene bank, Sperm bank, Superovulation, Cryopreservation
- 1.3 In Vitro Fertilization (IVF) and Embryo Transfer (ET)), Zygote Intra Fallopian Transfer (ZIFT), Intracytoplasmic Sperm Injection (ICSI)
- 1.4 Placentation -Types, examples and functions
- 1.5 Placenta Banking-Placenta preservation benefits

Unit - IV

Developmental Biology

- 1.1 Fertilization
- 1.2 Embryonic development of frog up to the formation of three germinal layers
- 1.3 Fate map construction in frog
- 1.4 Metamorphosis of Tadpole Larva
- 1.5 Parthenogenesis



Unit - V

Embryonic Development of Chick

- 1.1 Structure of hen's egg
- 1.2 Embryonic Development of chick embryo up to the formation of primitive streak
- 1.3 Fate map construction in chick
- 1.4 Extra embryonic membrane of chick: Formation and functions.

Practical

1. Spotting related to the cytology
 - a. Prokaryote and Eukaryote Cell
 - b. Stages of Mitotic cell division
 - c. Stages of Meiotic cell division
 - d. Lamp brush Chromosome
2. Spotting related to Reproductive biology and Embryology
 - a. T.S. Testis of Mammal
 - b. T.S. Ovary of Mammal
 - c. Developmental stages of Frog embryology
 - d. Developmental stages of Chick embryology
3. Squash preparation of onion root tip to understand the stages of Mitosis
4. Squash preparation of Grasshopper testis to understand the stages of Meiosis
5. Trypan Blue exclusion test of cell viability
6. Squash preparation of salivary gland chromosome from Chironomus larva / Drosophila.