

CLUSTER UNIVERSITY SRINAGAR
ZOOLOGY SEMESTER 4th
CORE COURSE IV
GENETICS AND EVOLUTIONARY BIOLOGY

THEORY

(CREDITS 4)

Unit 1

- 1.1. Mendelian genetics, Linkage, Linkage Maps and crossing over
- 1.2. Nature of heterochromatin
- 1.3. Organization of genetic material in prokaryotes and eukaryotes
- 1.4. Multiple alleles, Lethality, Epistasis, Sex linked inheritance, Extra chromosomal inheritance

Unit 2

2.1. Mutations

Structural and numeric changes in chromosomes, Gene mutations

2.2. Replication

Replication in prokaryotes and eukaryotes

2.3. Transcription and Translation

Transcription and post transcriptional modifications, translation

2.4. Sex determination

Chromosomal mechanism, dosage compensation

Unit 3

3.1. Introduction to evolutionary theories

Lamarckism, Darwinism, Neo-Darwinism

3.2. Evidence of Evolution

Types of fossils, dating of fossils, Phylogeny of horse

3.3. Processes of Evolutionary change

Organic variations; Isolating mechanism; Natural selection, Industrial melanism

3.4. Natural Selection

Directional, Stabilizing and Disruptive Selection; Artificial selection

Unit 4

4.1. Species Concept

Biological species concept: Modes of speciation (Allopatric and Sympatric)

4.2. Macro-evolution

Macro-evolutionary Principles (example: Darwin's Finches)

4.3. Extinction

Mass extinction, Causes and Role of extinction in evolution

4.4. Major extinctions

K-T extinction

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GENETICS AND EVOLUTIONARY BIOLOGY

PRACTICAL

(CREDITS 2)

1. Study of Human Karyotypes (normal and abnormal)
2. Study of fossil evidences from pictures
3. Study of homology and analogy from suitable specimens/pictures
4. Charts:
 - (a) Phylogeny of horse with diagrams
 - (b) Darwin's finches with diagrams/cut outs of beaks of different species
5. Visit to natural history museum and to national parks within and outside stae and submission of report