

SKILL ENHANCEMENT COURSE (SEC)**BZO: S603 GENETICS DISEASES AND COUNSELLING****(Credits: Theory-4)****SEMESTER -VI****Lectures: 60****Unit 1****Nucleic Acids**

Overview of the structure of DNA and RNA; Replication, transcription and translation (in brief); Control of gene expression, DNA methylation and imprinting.

Unit 2

Basics of human cytogenetic nomenclature; Chromosome identification; Various techniques of karyotyping; Autosomal and sex chromosomal abnormalities

Unit 3**Mendelian Genetics**

Mendel's experiments- laws and their exceptions; Introduction to linkage and recombination; Autosomal and X-linked inheritances; Multifactorial, Mitochondrial and complex inheritance.

Unit 4**Genetics of Human diseases**

Molecular genetics of Human disease; Genetic basis of various diseases like Sickle cell anaemia, PKU, Thalassemia, Alzheimer's, Diabetes, Hypertension, cardiovascular, Cancer; Pedigree analysis (Symbols, preparation and analysis); Prenatal diagnosis of genetic disorders

Unit 5**Genetic Counselling**

History, Famous Case Studies, Theory and Practice; Psycho-social aspects for the individual and the family in connection with genetic investigations; Legal aspects related to genetics, Medical termination of pregnancy act, PC-PNDT act and other aspects of medical jurisprudence, Introductory Gene Therapy

BZO: P651: LAB COURSE**GENETICS**

1. Study of Mendelian Inheritance and gene interactions (Non Mendelian Inheritance) using suitable examples. Verify the results using Chi-square test.
2. Study of Linkage, recombination, gene mapping using the data.
3. Study of Human Karyotypes (normal and abnormal).

B. EVOLUTIONARY BIOLOGY

1. Study of fossil evidences from plaster cast models and pictures
2. Study of homology and analogy from suitable specimens/ pictures
3. Charts:
 - a. Phylogeny of horse with diagrams/ cut outs of limbs and teeth of horse ancestors
 - b. Darwin's Finches with diagrams/ cut outs of beaks of different species
4. Visit to Natural History Museum, submission of report