

**SKILL ENHANCEMENT COURSE (SEC)**

**BZO: S603 GENETICS DISEASES AND COUNCELLING**

**(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