

# **CURRICULUM PLAN 2021-22 (ODD Semesters: III, V)**

## **ONLINE TEACHING Via GOOGLE MEET**

**Dr. Ranjana Roy Mishra**

### **Semester-III (semester system)**

### **B. Sc. (H) Botany LOCF**

### **Core Paper: Genetics**

Name of Paper & Code	Allocation of Lectures	Month wise schedule followed by the Department	Tutorial/Assignment etc.	Suggested readings
<b>Paper Core course VII Genetics</b>				
<b>Unit 1: Mendelian genetics and its extension</b> Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance.	16	Mid July-August 2021	Presentation by students	1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8th edition. 2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition. 3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.



<b>Unit 6: Fine structure of gene (5 lectures)</b> Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus.	05	Mid October to November 2021		
<b>Unit 6. Population and Evolutionary Genetics (7 lectures)</b> Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection mutation, genetic drift. Genetic variation and Speciation.	06	November 2021		
<b>PRACTICALS</b>				
1. To study Meiosis through temporary squash preparation in <i>Allium</i> .				August 2021
2. Gene interactions through seed ratios using Chi square analysis.				August 2021
3. To do problems based on Hardy-Weinberg's law.				August 2021
4. Pedigree analysis.				September 2021
5. To study listed human dominant and recessive traits and to observe the listed physical traits among the students present in the class. Data thus generated may be used for calculating allelic and genotypic frequencies using Hardy-Weinberg's principle.				September 2021
6. To Study syndromes: Down's, Klinefelter's, Turner's, Patau & Edward's syndromes				September 2021
7. To study colour blindness/ haemophilia (Ishihara cards for colour blindness).				September 2021
8. Chromosomal aberrations: Complex Translocation Ring, quadrivalents Lagging chromosomes and Inversion / Dicentric Bridge.				October 2021
9. Sickle cell anemia, Xeroderma Pigmentosum,				October 2021

**Semester-V (semester system)**  
**B. Sc. (Prog) Life Sciences LOCF**

**Discipline Specific Elective: Cell and Molecular Biology**

<b>PRACTICALS</b>	<b>Schedule</b>
1.To study prokaryotic cells ( <i>E. coli</i> ), viruses (TMV, T2phage), eukaryotic cells (Plants & Animals) with the help of electron micrographs.	July 2021
2. Study of photomicrographs of cell organelles( Nucleus, Mitochondria, Chloroplast, Golgi Complex, ER, lysosomes.	July 2021
3. Study of plant cell structure with the help of temporary peel mount of <i>Allium/Crinum</i> .	August 2021
4. To study structure of animal cells by temporary mounts of squamous epithelial cell and nerve cell through photograph	August 2021
5. To study striated muscle fiber through photograph.	August 2021
6.To prepare temporary stained preparation of mitochondria from cheek epithelial cells using vital stain Janus green.	August 2021
7. Study mitosis ( temporary mounts) and meiosis ( permanent slides).	September 2021
8. Study the effect of organic solvent and temperature on semi permeable membrane	September 2021
9. Demonstration of dialysis of starch and simple sugar	September 2021
10. Demonstration of plasmolysis and deplasmolysis on <i>Rhoeo</i> leaf.	October 2021
11. Measurement of cell size ( either length/breadth/diameter) by micrometry in <i>Allium</i> .	October 2021
12. Study of structure of nuclear pore complex by photograph (from Gerald Karp), Study of special chromosomes (Polytene & Lampbrush) either by slides or photographs.	October 2021
13. Study DNA packaging by micrographs.	November 2021
14. Preparation of karyotype and ideogram from given photograph of somatic metaphase chromosome.	November 2021