<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>No Of Lectures</th>
<th>Lecture Serial No</th>
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<tbody>
<tr>
<td>1</td>
<td>Mendel’s experimental organism, the green pea.</td>
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<td>Mendel’s Principle Monohybrid crosses: The principle of dominance and segregation.</td>
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<td>Dihybrid cross: The principle of Independent assortment.</td>
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<td>Application of Mendel’s Principles. Punnett Square. Forked Line Methods, Probability Chi Square method.</td>
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<td>Human Genetics.</td>
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<td>2</td>
<td>Incomplete dominance and co-dominance.</td>
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<td>Multiple alleles.</td>
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<td>Allelic series. Variation among the effect of the mutation.</td>
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<td>Gene functions to produce polypeptides.</td>
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<td>Gene Action: Genotype and phenotype.</td>
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<td>Influence of the environment.</td>
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<td>Environmental effect on the expression of the Human Genes.</td>
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<td>Gene Interaction. Epistasis.</td>
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<td>Chromosome Chromosome Number.</td>
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<td>Sex Chromosome.</td>
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<td>The chromosomal theory of heredity.</td>
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<td>Experimental evidence linking the inheritance of genes to chromosome.</td>
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<td>Chromosome as arrays of gene. Non-disjunction as proof of the chromosome theory.</td>
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<td>Sex Linked Gene in Human Beings.</td>
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<td>Sex Chromosome and Sex Determination.</td>
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<td>Dosage Compensation of the X-linked genes.</td>
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<td>Cytogenetical techniques.</td>
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<td>Variations in chromosome structure.</td>
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<td>Variations in chromosome number.</td>
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<td>25-26</td>
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### 5. Unit
**Non-Mendelian inheritance**
- Evidences for Cytoplasmic factors, cytoplasmic inheritance: 2 27-28
- extranuclear inheritance (mitochondrial, chloroplast): 2 29-30
- non-chromosomal inheritance, maternal inheritance, uniparental inheritance: 2 31-32

### 6 Unit
**Genetic analysis of development**
- Model organism for genetic analysis of development: 2 33-34
- Development results from differential gene expression: 1 35
- Genetic study: Genetic Regulation of the development of the Drosophila body plan: 2 36-37

### 7 Unit
**Population genetics**
- Theory of allelic frequencies: 1 38
- Natural Selection: 2 39-40
- Random Genetic Drift: 2 41-42

### REFERENCE BOOKS:
- Genetics by Russell
- Genetics by Klug
- Genetics by Tamarind
- Genetics by Snustad & Simmons
- Genetics by C.B Powar
- Genetics by B.D Singh
- Genetics by Pierce

### Evaluation scheme

<table>
<thead>
<tr>
<th>Sno</th>
<th>Examination</th>
<th>Time</th>
<th>Marks</th>
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<tr>
<td>1</td>
<td>Minor test 1</td>
<td>45 Minutes</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Minor test 2</td>
<td>45 Minutes</td>
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<tr>
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<td>Internal &amp; Assignment</td>
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PRACTICALS IN HUMAN GENETICS (2 Hrs. Per Week)
MARKS : 100

LIST OF EXPERIMENT
1. Model Organisms and their significance in Genetic studies: 05 Prs.
   Virus – TMV (Tobacco leaves),
   Bacteria – E coil (slide)
   Neurospora and Yeast (slides)
   Paramecium (slides)
   Coenorhabites elegans.
   Drosophila melanogaster – Life Cycle
   Mosquito (Anopheles and Culex) – Life cycle
   Dissected reproductive system of Rat -
   Maize, Pea, Arabidopsis – Life Cycle
2. Induction of polyploidy in Onion root tips.
3. Methyl Green-Pyronin Staining of DNA
4. Dermatoglyphs of human fingers
5. Human Karyotype.
6. ABO Blood Gr
7. Genetic traits in population
8. Founder Effect
9. Isolation of Mitochondrial DNA
10. Plasmid DNA isolation
11. β Thalassemia
12. VNTR marker
13. Replica Plate Techniques
14. Growth curve analysis