



**B. Sc. (Botany) SEMESTER-IV**

**Paper-I**

**(Genetics, Molecular Biology and Plant Nursery)**

**UNIT-I**

**Genetics: (Mendelism, Linkage and crossing over).**

1. **Mendelism:** Basic terminology

[https://youtu.be/aGn4cp1c65U?si=v\\_3cW8ydhibV6VG2](https://youtu.be/aGn4cp1c65U?si=v_3cW8ydhibV6VG2)

Law of segregation

[https://youtu.be/jV6SA\\_5CPik?si=xMKrV-yqTa0vo7W1](https://youtu.be/jV6SA_5CPik?si=xMKrV-yqTa0vo7W1)

and law of independent assortment

<https://youtu.be/8FRnpjyuy6Q?si=m61DmwIPArDfRNkQ>

2. **Interaction of genes:** Allelic: Incomplete dominance (1:2:1)

[https://youtu.be/iHVC\\_NQbOIE?si=I6E82YrdbO8rA2Wv](https://youtu.be/iHVC_NQbOIE?si=I6E82YrdbO8rA2Wv)

Non-allelic: Complementary factors (9:7) and Dominant epistasis (12:3:1)

<https://youtu.be/xMhOBRaznwQ?si=jRuIUH6luY8yClfK>

3. **Linkage:** Definition. Theory of linkage: Coupling and Repulsion, Types: Complete and Incomplete linkage

[https://youtu.be/9Qxb90T8HRw?si=k2pYhQIogZb\\_qxMd](https://youtu.be/9Qxb90T8HRw?si=k2pYhQIogZb_qxMd)

4. **Crossing over:** Definition, Breakage and reunion theory, significance of crossing over

[https://youtu.be/wVfYq24qEOK?si=aXwuu\\_Q2RpXdzEg](https://youtu.be/wVfYq24qEOK?si=aXwuu_Q2RpXdzEg)

**UNIT-II**

**Mutation:**

1. **Mutation:** Definition, Types: Spontaneous and induced mutation, Physical and Chemical mutagens applications of induced mutations

<https://youtu.be/iEbCJH5UQKc?si=ZOLddfhr9otubjxV>

<https://youtu.be/3KiaFO8VbZk?si=V2P9Zz2USG828Yry>

2. **Chromosomal aberrations:** Deficiency, Duplications, Inversion and Translocation

<https://youtu.be/t6B222tJ9hk?si=kHHvddKVAnVJBU5S>



3. **Variation in chromosome number:** Aneuploidy (Nullisomics, Monasomics, Trisomies and Tetrasomics), Euploidy (Autopolyploidy, Allopolyploidy); Significance.

[https://youtu.be/I6vwgDRfo\\_g?si=VfufEREuKn3MnM2S](https://youtu.be/I6vwgDRfo_g?si=VfufEREuKn3MnM2S)

4. **DNA Damage and Repair:** Photoreactivation and Excision Repair

<https://youtu.be/XW5mue01ScY?si=XdL2xiJwqUCuCF6I>

### **UNIT-III**

#### **Molecular biology**

1. **DNA:** Structure of DNA (Watson and Crick's model)

[https://youtu.be/OkbfqTfcvm8?si=NeLKs3\\_MVbHhj0Q5](https://youtu.be/OkbfqTfcvm8?si=NeLKs3_MVbHhj0Q5)

2. Replication of DNA: semiconservative method of DNA replication

<https://youtu.be/C3mRYoqeIB8?si=K1mUv7IThjpt9D5j>

3. **RNA:** Types

<https://youtu.be/AWjijxPYHU?si=JstEqVUJNcurBjET>

Clover leaf model of t-RNA 2

<https://youtu.be/uDINJVJq7t0?si=0WGhWxk-JQIoOBnj>

4. **Concept of gene:** Classical: Cistron, Muton and Recon

[https://youtu.be/tZgG-O9d-rY?si=vkmTA\\_67SZJ7LzEx](https://youtu.be/tZgG-O9d-rY?si=vkmTA_67SZJ7LzEx)

5. **Genetic code:** Definition and characteristics

<https://youtu.be/pfCHDPN-iK4?si=jv3PG5hWjYNInoGw>

6. **Protein synthesis:** Transcription

<https://youtu.be/O--e0i9JQdo?si=pMAy1VqKKOsM-isZ>

and Translation

<https://youtu.be/odFng4YdB6g?si=awevJfOC8gmxgaL>

7. **Regulation of gene action:** Lac-Operon model

<https://youtu.be/JImCiDicfQw?si=KwD6Vh4J-sh60NDP>

### **UNIT-IV**

#### **Skill Development: Plant nursery**

1. **Nursery:** Definition and Role or objective

<https://youtu.be/hNI5hShIz0A?si=RZlWfmvwIhsLiUgu>

nursery infrastructure



[https://youtu.be/JK2R110FR\\_M?si=xPo8SRPSi5BH\\_BoL](https://youtu.be/JK2R110FR_M?si=xPo8SRPSi5BH_BoL)

**2. Planning and seasonal activities:** Preparation of nursery beds

<https://youtu.be/AVpryAmcb4Y?si=kQSmx49Te7T2ANy2>

Planting direct seeding and transplant

<https://youtu.be/4naHCNU0y-k?si=EtfGKKkqo8bAtss0>

Air layering

[https://youtu.be/1OvVjHC2JV0?si=Nkp9\\_Hr\\_Oqz2ISSn](https://youtu.be/1OvVjHC2JV0?si=Nkp9_Hr_Oqz2ISSn)

Budding

<https://youtu.be/PigCopBQ2CA?si=JUlr-oSZ7tJW5oBK>

Grafting

[https://youtu.be/N5ffHoU9h9g?si=ShLT6D\\_R-QkAcHL8](https://youtu.be/N5ffHoU9h9g?si=ShLT6D_R-QkAcHL8)

cutting, rooting medium

<https://youtu.be/Rrh2gsZpZq8?si=HCSfWHZ5KHNoFYDu>

hardening of plant

<https://youtu.be/PIIiOKH02PM?si=yT7z-WjsWOpgaWHz>

**3. Nursery management:** Routine garden operations

<https://youtu.be/JRx69DVrDBs?si=T4eCOgewzFrOiL62>

soil sterilization

[https://youtu.be/ndPus\\_7vLNU?si=NYZMYagjktRqnae](https://youtu.be/ndPus_7vLNU?si=NYZMYagjktRqnae)

seed sowing

[https://www.youtube.com/live/J2unvYrKw6I?si=-9BDfjqz1x-Pl\\_0x](https://www.youtube.com/live/J2unvYrKw6I?si=-9BDfjqz1x-Pl_0x)

pricking planting and transplanting,

<https://youtu.be/oq2ReaUz19k?si=nz17iPPYskTXiNjI>

shading, stopping or pinching defoliation

<https://youtu.be/SviJXjq3BuY?si=-av1bd9XeZimK4Lk>

wintering, mulching and topiary

<https://youtu.be/j4HKv7Ikogw?si=Jb7IsIc8P1jN3k96>

<https://youtu.be/hNI5hShIz0A?si=Wwlw5yfVZSMKT-OT>