

Semester V/VI

Biochem Elective: Classical Genetics

(2 credits)

Unit 1:

- Introduction to genetics
- Mendelian Genetics
 - i) History of Mendelian genetics
 - ii) First Law of Inheritance
 - iii) Second Law of Inheritance
 - iv) Test Cross and Back cross

Unit 2:

- Genes, Alleles and mutations
- Incomplete Dominance, codominance
- Gene Interactions and Epistasis
- Gene Lethality

Unit 3:

- Chromosomal theory of inheritance and inheritance patterns
- Special banding patterns in human chromosomes
- Sex linkage, non-disjunction as proof of chromosomal theory of inheritance

Unit 4:

- Chromosomal aberrations: structural and numerical
- Linkage and crossing over
- Gene mapping

Semester V/VI

Biochem Elective: Plant Biochemistry

(2 credits)

Unit I: Plant Cell and System

Plant cell structure and its organelles;
Plant Cell Wall Formation and its functions;
Tissue Systems; Cell types and their functions;
Plant Organ Systems

Unit II: Biochemical Processes and Metabolic pathways specific to plants - Photosynthesis

Light reactions: i) Cyclic photophosphorylation

ii) Non –cyclic photophosphorylation

Dark reactions: i) Calvin’s Cycle (C3 metabolism)

ii) C4 metabolism

iii) CAM metabolism

Photorespiration

Unit III: Biochemical Processes and Metabolic pathways specific to plants

Nitrogen fixation and assimilation

Sucrose synthesis and breakdown

Phosphate uptake systems and role in cells

Sulphate assimilation

Unit IV: Phytohormones

Auxins: Biosynthesis, transport, signal transduction and downstream effect

Cytokinins: Biosynthesis, transport, signal transduction and downstream effect

Gibberelins: Biosynthesis, transport, signal transduction and downstream effect

Abscissic acid: Biosynthesis, transport, signal transduction and downstream effect

Ethylene: Biosynthesis, transport, signal transduction and downstream effect

Introduction to salicylic acid and jasmonic acid

Ref:

1. Berg JM, and Tymoczko TJ, Stryer L,: Biochemistry (6th ed)
2. Davies Peter: Plant hormones (3rd ed) 2004.
3. Donald Voet and Voet J: Biochemistry (4th ed) 2011
4. Goodwin TW and Mercer, E.I, introduction to Plant Biochemistry, Pergamon Press.
5. Grisham and Garrett: Biochemistry (3rd ed)
6. Hall, DO, Rao, KK.,Photosynthesis (1996), Cambridge University Press.
7. Heldt, Hans-Walter, Plant Biochemistry and Molecular Biology (1997), OUP.
8. Nelson DL and Cox MM: Lehninger’s Principles of Biochemistry (5th ed) 2008
9. Salisbury and Ross: Plant Physiology, CBS Publications, Delhi.

Semester VI

Biochem Elective: 305: Project

(2 credits)

It is offered as optional to those students who would like to take up research at UG level. Work will be carried out in the respective college under a mentor and evaluation should be done by University examiner.