



Code	Subject Title	Cr. Hrs	Semester
BOT-202	Botany Lab-III (Cell Biology, Genetics and Evolution)	1	III
Year	Discipline		
2	Botany, Zoology, Chemistry-I		

**Syllabus Outline:** Development of Concepts about Cell Structure, Chromosomal Morphology, mechanisms of Cell Division, Extraction of Protein, DNA, RNA from Plant Sources, Genetical Problems related to Transmission and Distribution of Genetic Material.

**Course Outline:**

**a) Cell Biology:**

1. Study of cell structure using Compound Microscope and elucidation of Ultrastructure from Electron Microphotographs.
2. Measurement of Cell Size.
3. Study of Mitosis and Meiosis by Smear/Squash Method and from Prepared Slides.
4. Study of Chromosome Morphology and Variation in Chromosome Number.
5. Extraction and Estimation of Carbohydrates, Proteins, RNA and DNA from Plant Material.

**b) Genetics:**

1. Genetic Problems related to Transmission and Distribution of Genetic Material.
2. Identification of DNA in Plant Material (Carmine/ Orcein Staining).
3. Study of salivary gland chromosomes of *Drosophila*.

**Module Aims:** The aim of this course is to provide the knowledge to the students about the structure and functions of different cell structure organelles under laboratory conditions.

**Learning Strategies:**

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

**Learning Outcome:** The learning outcomes will be same as theory paper. On completion the students will be able to understand Scientific Methods for Implementation in Applied Courses of Cell Biology, Genetics and Evolution.

**Assessment Strategies:**

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

**Books Recommended:**

1. **Bretscher, A. (2007).** *Molecular Cell Biology*. W. H. Freeman and Company



2. **Griffiths, J.F., Miller, J.H., Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2003).** *An Introduction to Genetic Analysis*. W.H. Freeman and Company.
  3. **Sinha, U. and Sinha, S. (2003).** *Cytogenesis, Plant Breeding and Evolution*. Vini Educational Books, New Delhi.
  4. **Strickberger, M.V. (2003).** *Genetics*. MacMillan Press Ltd., London.
  5. **Karp, G. (2002).** *Cell and Molecular Biology. Concepts and Experiments*. (4<sup>th</sup> Ed.), John Wiley and Sons. New York.
  6. **Gilmartin, P.M. and Bowler. C. (2002).** *Molecular Plant Biology*. (Vol. 1 & 2). Oxford University Press. UK.
  7. **Lodish, H. (2001).** *Molecular Cell Biology*. W.H. Freeman and Co.
  8. **Dyonsager, V R. (2000).** *Cytology and Genetics*. (3<sup>rd</sup> Ed.), TATA and McGraw Hill Publication Co. Ltd, New Delhi.
-