**CURRICULUM PLAN 2022-23 (ODD Semesters: III, V)**

**Semester-V (semester system)**

**B. Sc. Life Science 3rd year**

**Core Paper: Cell and molecular biology**

**Dr. Naghma Praween**

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| Name of Paper & Code | Allocation of Lectures | Month wise schedule followed by the Department | Tutorial/Assignment etc. | | Suggested readings |
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| **Unit 4 : Cell Membrane and Cell Wall**  The functions of membranes , Models of membranes structure ( Overton , Langmuir, Robertson, Singer and Nicolson) , The fluidty of membranes, Membranes Proteins ( 3 types) and their functions ( brief account) , Carbohydrates in the membranes ( brief account) Faces of the membranes, Selective permeability of the membranes , Cell Wall .  **Unit 5:** Cell Cycle Overview of Cell cycle, Mitosis and Meiosis; Molecular controls.  **Unit 6** **Genetic material DNA:** Miescher to Watson and Crick- historic perspective, Griffith's and Avery's transformation experiments, Hershey-Chase bacteriophage experiment, DNA structure, types of DNA, types of genetic material. DNA replication (Prokaryotes and eukaryotes): bidirectional replication, semi—conservative, semi discontinuous RNA priming, 6 (theta) mode of replication, replication of linear, ds-DNA, replicating the 5 end of linear chromosome including replication enzymes.  **Unit 7 Transcription** (Prokaryotes and Eukaryotes) (6 Lectures) Types of structures of RNA (mRNA, tRNA, rRNA), RNA polymerase- various types; Translation (Prokaryotes and eukaryotes), genetic code.  **Unit 8** Regulation of gene expression Prokaryotes:Lac operon and Tryptophan operon ; and in Eukaryotes  **Practical 1.** To study prokaryotic cells (bacteria), viruses, eukaryotic cells with the help of light and electron micrographs.  2.Study of the photomicrographs or cell organdies  3. To study the structure of plant cell through temporary mounts.  4. To study the structure of animal cells by temporary mounts-squamous epithelial cell and nerve cell.  5. Preparation of temporary mounts of striated muscle fiber  6. To prepare temporary stained preparation of mitochondria from striated muscle cells /cheek epithelial cells using vital stain Janus green.  7. Study of mitosis and meiosis (temporary mounts and permanent slides).  8. Study the effect of temperature, organic solvent on semi permeable membrane.  9. Demonstration of dialysis of starch and simple sugar.  10. Study of plasmolysis and deplasmolysis on Rhoeo leaf  11. Measure the cell size (either length or breadth/diameter) by micrometry.  12. Study the structure of nuclear pore complex by photograph (from Gerald Karp) Study of special chromosomes (polytene&lampbrush) either by slides or photographs.  13. Study DNA packaging by micrographs.  14. Preparation of the karyotype and ideogram from given photograph of somatic metaphase chromosome. | 2 Lectures  4 Lectures  6 Lectures    2 Lectures    4 Lectures  6 Lectures    6 lectures | August  August    August    September  September  September  October  October  August 2022  August 2022  August 2022  September 2022  September 2022  September 2022  October 2022  October 2022  November 2022 | Assignment | | Gerald Karp : cell and Molucular biology. 6th Edition  De Roberties: 6th Edition  Cooper , 5th Edition  Becker |
| . **Skill Enhancement Course**  **B. S c life Science: Semester v**  **Unit 1: ETHNOBOTANY**  Introduction, concept, scope, and objectives. Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context. Major and minor ethnic groups or Tribals of India and their life style. Plants used by tribals ( a) Food plants b) Intoxicants and beverages c) Resins, Oils, and miscellaneous uses**.**  **Unit 4** Role of ethnobotany in modern medicine with special example of Rauvolfiasepentina, Trichopuszeylanicus, Artemisia,Withania.Role of ethnic groups in conservation of plant genetic resources.Endangered taxa and forest management (participatory forest management).  **Unit 5** Ethnobotany and legal aspects Ethnobotany as a tool to protect interests of ethnic groups.Sharing of wealth concept with few examples from India; Biopiracy. | 6 lectures  8 lectures | August- 2022  September 2022 | Assignment | | S.K Jain  Jain, S.K. (1981). Glimpses of Indian Ethnobotany |
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| **PRACTICALS Semester-III(semester system)**  **B. Sc. Life Sciences** | **Schedule** |
| **Plant Anatomy and Embryology Practical:**  **B.Sc life science 2nd year**  Practical 1. Study of meristems through permanent slides and photographs.  2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)  3. Stem: Monocot: Zea mays; Dicot: Helianthus.  4. Root: Monocot: Zea mays; Dicot: Helianthus.  5. Leaf: Dicot and Monocot (only Permanent slides).  6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).  7. Structure of anther (young and mature).  8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous.  9. Female gametophyte: Polygonum (monosporic) type of Embryo sac (Permanent slides/photographs).  10. Pollination types and seed dispersal mechanisms (including appendages, aril,caruncle) Photographs/specimens).  11. Dissection of embryo/endosperm from developing seeds.  12. Calculation of percentage of germinated pollen in a given medium. | August 2022  August 2022  August 2022  September 2022  September 2022  September 2022  October 2022  October 2022 |