***TENTATIVE LESSON PLAN (EVEN SEMESTERS)***

*SESSION: 2024-25*

*Name of the Teacher: Mrs. Jyoti Department: Botany*

*Subject/Course: Cytology and Genetics. Programme: B.Sc II Life Science*

*Semester: 4th*

| *Unit* | *Name of Topic/Contents* | *Tentative Dates/Days* |
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|  | *Cell as a unit of Life; The Cell Theory; Prokaryotic and eukaryotic cells; Eukaryotic Cell components* | *January* |
|  | *Structure and functions of Cell Wall, Plasma Membrane, nucleus, Nuclear Envelope- structure of nuclear pore complex, Golgi Apparatus, Ribosome, Endoplasmic Reticulum, Chloroplast, Mitochondria and Vacuoles.**Cell Division: Mitosis and Meiosis.* | *February*  |
|  | *Chromosome: structural organization, ultrastructure of Centromere, lampbrush and polytene chromosomes.**DNA: structure, types and replication.**RNA: structure and types.**Genetic code* | *March* |
|  | *Complete & incomplete linkage, recombination frequency, crossing over.**Mendel's laws of Inheritance.**Lethal Genes; Codominance, incomplete dominance; Gene interaction (inter- and intra-allelic); Multiple allelism; Pleiotropism.**Cytoplasmic Inheritance: leaf variegation in Mirabilis jalapa* | *April* |
|  | *Chromosomal aberrations- deletions, duplications, translocations, inversions; Variations in chromosome number- aneuploidy, polyploidy; sex chromosomes and sex determination.* |  *May* |

*Name of the Teacher: Mrs. Jyoti Department: Botany*

*Subject/Course: Biochemistry and Plant Biotechnology Programme: B.Sc III Medical & Biotechnology*

*Semester: 6th*

| *Unit* | *Name of Topic/Contents* | *Tentative Dates/Days* |
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| *1.* | *Basics of Enzymology: Discovery and nomenclature, characteristics of enzymes, concept of holoenzyme, apoenzyme, coenzyme and co-factors, regulation of enzyme activity, mechanism of action.* | *January* |
| *2.* | *Growth and development: Definitions; phases of growth and development; Plant hormones auxins, gibberellins, cytokinins, abscisic acid and ethylene, history of their discovery, mechanism of action; photo-morphogenesis; phytochromes and their discovery, physiological role and mechanism of action.**Lipid metabolism: Structure and functions of lipids; fatty acid biosynthesis; Beta-oxidation; saturated and unsaturated fatty acids, storage and mobilization of fatty acids.* | *February*  |
| *3.* | *Nitrogen metabolism: Biology of nitrogen fixation, importance of nitrate reductase and its regulation, ammonium assimilation.**Genetic engineering and Biotechnology: Tools and techniques of recombinant DNA technology, cloning vectors; genomic and cDNA library, transposable elements, aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis; biology of Agro-bacterium, vectors for gene delivery and marker genes.* | *March* |
| *4.* | Origin, distribution, botanical description, brief idea of cultivation and uses of the following:Food plants- Cereals (Rice, Wheat and Maize). Pulses- (Gram, Arhar and Pea). Vegetables- (Potato, Tomato and Onion).Fibers- Cotton, Jute and Flax.Oils- Groundnut, Mustard and Coconut.Morphology of plant part used, brief idea of cultivation and uses of the following:  Spices- Coriander, Ferula, Ginger, Turmeric, Cloves. Medicinal Plants- Cinchona, Rauwolfia, Atropa, Opium, Cannabis,  Neem. | *April* |
| *5.* | *Botanical description and processing of:* *Beverages- Tea and Coffee.* *Rubber- Hevea.* *Sugar- Sugarcane.**General account and sources of timber; energy plantations and bio-fuels.* |  *May* |