**Savitribai Phule Pune University**

*Satyaniketan’s*

**Adv. M.N.Deshmukh Arts, Science & Commerce College Rajur**

**F.Y.B.SC. BOTANY SEM – II - PAPER – II**

**BO-122: PRINCIPLES OF PLANT SCIENCE**

**(30 Lectures)**

**TEACHING PLAN**

(2023-24)

Submitted By

**Dr. Deepmala Tambe**

**Department of Botany**

**SEMESTER-II: PAPER-II**

**BO-122: PRINCIPLES OF PLANT SCIENCE (30 Lectures)**

**CREDIT-1: PLANT PHYSIOLOGY AND CELL BIOLOGY**

**15 Lectures (15 Hours) (2023-24)**

|  |  |  |
| --- | --- | --- |
| **Month** | **Unit** | **No. of Lecture** |
| **January** | **CREDIT-1: PLANT PHYSIOLOGY AND CELL BIOLOGY** 1. Introduction, definition and scope of plant physiology. 2. Diffusion – definition, importance of diffusion in plants, imbibition as a special type of diffusion. 3. Osmosis – definition, types of solutions (hypotonic, isotonic, hypertonic), endosmosis, exo-osmosis, osmotic pressure, turgor pressure, wall pressure, importance of osmosis in plants. 4. Plasmolysis – definition, mechanism and significance. 5. Plant growth - introduction, phases of growth, factors affecting growth,  | **06** |
| **February** | 6. Structure of plant cell, differences between prokaryotic and eukaryotic cell. 7. Plant cell wall – components of primary cell wall, structure and functions. 8. Ultrastructure and functions of chloroplast 9. Cell cycle in plants- importance of cell cycle in plants, divisional stages of mitosis and meiosis.  | **07** |
| **March** | **CREDIT-II: MOLECULAR BIOLOGY (15 Lectures)** 1. Introduction and scope of molecular biology, central dogma of molecular biology. 2. Structure of DNA, nucleoside and nucleotide 3. Watson Crick model of DNA and its characteristic features, types of DNA (A, B and Z DNA).  | **07** |
| **April** | 4. Types of chromosomes. 5. Structure and types of RNA 6. DNA replication- Types of replication (conservative, semi-conservative and dispersive), enzymes involved, leading and lagging strands, Okazaki fragments.  | **08** |

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**T.Y.B.SC. BOTANY SEM – V - PAPER – I**

**BO 351: CRYPTOGAMIC BOTANY (ALGAE AND FUNGI)**

**TEACHING PLAN**

(2022-23)

Submitted By

**Dr. Deepmala Tambe**

**Department of Botany**

**T.Y.B.Sc. Botany CBCS Pattern**

**(Semester V, Paper I) 2020-2021**

**BO 351: Cryptogamic Botany (Algae and Fungi)-**

 **2 Credits (30 Lectures)**

|  |  |  |
| --- | --- | --- |
| **Month** | **Unit** | **No. of Lecture** |
| **July** | **Credit-I**Introduction: Cryptogams- meaning. Types- Lower Cryptogams, briefReview with examples | **05** |
| Algae: General characters, distribution, Thallus organization, habit andHabitat reproduction and Classification (G.M.Smith 1955) up to classes. |
| **August** | Study of life cycle of algae with reference to taxonomic position,Occurrence, Thallus structure, and reproduction of *Nostoc, Oedogonium**Chara, Sargassum* and *Batrachospermum*. | **08** |
|  |  |
| **September** | Economic importance of algae- Role in industry, agriculture, fodder andmedicine.Fungi: General characters, Habit and habitats, thallus organization, cell wallcomposition, nutrition and Classification. (Alexopoulos and Mims 1979) upto classes. | **09** |
| Study of life cycle of fungi with reference to taxonomic position, thallusstructure, and reproduction of *Mucor (Zygomycotina), Saccharomyces**(Ascomycotina), Puccinia (Basidiomycotina), Penecillium and Cercospore**(Deuteromycotina) [Two members of Deutero.]* |
| Symbiotic Associations - Lichens, Mycorrhiza and their significance |
| **October** | Study of life cycle of fungi with reference to taxonomic position, thallusstructure, and reproduction of *Mucor (Zygomycotina), Saccharomyces**(Ascomycotina), Puccinia (Basidiomycotina), Penecillium and Cercospore**(Deuteromycotina) [Two members of Deutero.]*Biological disorders of lipid metabolism. Commercial applications. | **08** |

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**Adv. M.N.Deshmukh Arts, Science & Commerce College Rajur**

**T.Y.B.SC. BOTANY SEM – V - PAPER – V**

**BO 355: CELL AND MOLECULAR BIOLOGY**

**TEACHING PLAN**

(2022-23)

Submitted By

**Dr. Deepmala Tambe**

**Department of Botany**

**T.Y.B.Sc. Botany CBCS Pattern**

**(Semester V, Paper I) 2020-2021**

**BO 351: Cryptogamic Botany (Algae and Fungi)-**

 **2 Credits (30 Lectures)**

|  |  |  |
| --- | --- | --- |
| **Month** | **Unit** | **No. of Lecture** |
| **July** | **Credit-I****Introduction to Cell Biology :** Definition, Brief history of Cell Biology,Units of measurement for cell, Interdisciplinary nature of Cell Biology | **07** |
| **Cell organelles**: Ultrastructure, components and functions of Cell wall andcell membranes, mitochondria and Chloroplast, endoplasmic Reticulum,Golgi apparatus, Lysosomes, Vacuoles, Peroxisomes & Glyoxysomes |
| **August** | **Nucleus:** Morphology and ultrastructure of nucleus, nucleolus andnucleolar organizer Nuclear envelope – structure of nuclear pore complex,transport of molecules across nuclear envelope. | **06** |
| Chromosomes: Euchromatin and heterochromatin Histones, Packing ofDNA into chromosomes in eukaryotes, Karyotype and ideogram, Polytenechromosomes and lampbrush chromosomes. |
| **September** | **Cell signaling:** Introduction and definition, Signaling molecules andreceptors, Calcium signaling pathway in plants | **07** |
| **Genetic material** DNA: historical perspective from 1953 to 2020, Griffith’sand Avery’s transformation experiments, Hershey-Chase bacteriophageexperiment. |
| **October** | **Gene expression:Transcription (Prokaryotes in details and passing****remarks on Eukaryotes)** Types of RNA: mRNA, tRNA, rRNA; types ofpromoters; types of RNA polymerase enzymes in eukaryotes; molecularmechanism of transcription. | **10** |
|  | **Translation (Prokaryotes and Eukaryotes):** Definition, concept andproperties of genetic code; molecular mechanism of translation. |
|  | **Regulation of gene expression:** Concept of operon, *lac* operon and *trp*operon, positive and negative control, one gene one enzyme hypothesis. |

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