|| Sheelam Param Bhooshanam ||

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal's

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

2024-2025

|| Sheelam Param Bhooshanam ||

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal's

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

2024-2025

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MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha A. Shendure**

Program: **B.Sc I** Semester: **I**

Subject: **Botany** Paper No.: **I (SBOTO01)**

Course Title: **Biodiversity of Microbes, Algae and Fungi**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Introduction to plant diversity:</td><td rowspan="2">1.1 Plant Diversity- concept, Plant kingdom- cryptogams and phanerogams
1.2 Diversity in plant kingdom- habit, habitat, duration of life</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Introduction to plant diversity:
Unit II: Microbes</td><td rowspan="2">1.3 Position of plants in five kingdom system.
2.1.Viruses: Discovery, general characters and structure of viruses, types of viruses- DNA virus- T-phage, RNA virus- TMV, Economic importance of viruses</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Microbes</td><td rowspan="2">2.2. Bacteria: Discovery, General characters, cell structure, Types based on shape, Mode of reproduction- vegetative, Asexual and Sexual – Conjugation, Economic importance.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha A. Shendure**

Program: **B.Sc II** Semester: **III**

Subject: **Botany** Paper No.: **VI (SBOTO03)**

Course Title: **Plant Physiology**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit 1. Photosynthesis</td><td rowspan="2">1.1 Plant Diversity- concept, Plant kingdom- cryptogams and phanerogams 1.1: Introduction
1.2: structure of chloroplast
1.2: Photosynthetic pigments- Chlorophylls, Carotenoids and Phycobilin)
1.3: Mechanism of Photosynthesis:
a) Light reaction- Photolysis of water, Photophosphorylation- Cyclic and Non-cyclic.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit 1. Photosynthesis

Unit 2: Respiration</td><td rowspan="2">b) Dark reaction: C3, C4 and CAM pathways of
carbon fixation.
1.4: Significance of photosynthesis
2.1: Introduction
2.2: Types of respiration
2.3: Glycolysis</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit 2: Respiration</td><td rowspan="2">2.4: Formation of Acetyl Co A
2.5: TCA cycle
2.6: ETS in mitochondria
2.7: Fermentation</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha A. Shendure**

Program: B.Sc **III** Semester: **V**

Subject: **Botany** Paper No.:**IX (SBOTO09)**

Course Title: **Genetics and Plant breeding**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Principle of Inheritance

Unit 2. Linkage and Recombination</td><td rowspan="2">1.1 Basic terminologies and Laws of Inheritance – Law of Dominance, Segregation and Independent assortment
1.2 Gene Interaction-
a) Complementary gene interaction
b) Supplementary gene interaction
2.1 Linkage: Definition, Linkage group, Types, Coupling and Repulsion phase, Significance.
2.2 Recombination (Crossing over): Definition, Types, Mechanism of crossing over, Significance.</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Chromosomes structure and Variation</td><td rowspan="2">1.1 Chromosome structure - Introduction, types (based on position of centromere)
1.2 Quantitative inheritance: a) Polygene inheritance-
Concept, examples- Kernel colour in wheat,
1.3 Plastid inheritance in Mirabilis jalapa.
1.4 Change in chromosome structure- Deletion,</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>Duplication, Inversion and Translocation.
1.5 Change in chromosome number- Euploidy and
Aneuploidy.</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: 2. Plant Breeding</td><td rowspan="2">2.1 Introduction, Definition, Aims and objectives
2.2 Methods of Plant Breeding
a) Introduction and Acclimatization
b) Selection – i) Mass Selection; ii) Pure Line Selection;
iii) Clonal Selection
c) Hybridization techniques in Self and Cross pollinated
crops
d) Male Sterility and its significance
e) Mutation Breeding – Gamma Garden</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Bhairu N. Shinde**

Program: **B.Sc I** Semester: **I**

Subject: **Botany** Paper No.: **SBOTO01**

Course Title: **Biodiversity of Microbes, Algae and Fungi**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III :Algae</td><td rowspan="2">1.1. General Characters, Classification as per G.M. Smith up to Classes.
1.2. General characters of each class with suitable example
1.3. Economic importance of algae.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III :Algae

Unit IV: Fungi</td><td rowspan="2">1.4. Morphology and life cycles (Excluding developmental stages) of following types-
a. Cyanophyceae - Nostoc
b. Chlorophyceae – Spirogyra
2.1 General characters, Classification as per Ainsworth (1973)- up to Classes.
2.2 General characters of each division with suitable examples.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Fungi</td><td rowspan="2">2.3 Economic importance of fungi.
2.4 Morphology and life cycles (Excluding developmental stages) of following types-
a. Zygomycotina – Mucor
b. Ascomycotina – Aspergillus.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Bhairu N. Shinde**

Program: **B.Sc II** Semester: **III**

Subject: **Botany** Paper No.: **VI (SBOTO03)**

Course Title: **Plant Physiology**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Plant water relationship</td><td rowspan="2">1.1:Introduction, Physiological importance of water.
1.2: Water transport process: Mechanism of water absorption: active and passive absorption theories, water transport through xylem.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Plant water relationship

Unit II: Mineral nutrition</td><td rowspan="2">1.3: Transpiration: Definition, Types of transpiration, Mechanism of stomatal movement, Starch-sugar hypothesis, Factors affecting transpiration, Significance of transpiration
2.1: Introduction, Macro and Micronutrients</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Mineral nutrition</td><td rowspan="2">2.2: Criteria of essentiality
2.3:Mineral nutrient uptake-Passive uptake (Diffusion), Active uptake (Carrier Concept)</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

				2.4: Role and Deficiency Disorders of Macronutrients (P, K, Ca, Mg) and Micronutrients (Fe, Mn) in plants and its recovery

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Bhairu N. Shinde**

Program: **B.Sc III** Semester: **V**

Subject: **Botany** Paper No.: **XI (SBOTO11)**

Course Title: **Cytology and Research Techniques in Biology**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Cell as a unit of life

Unit II: Cell Organelles</td><td rowspan="2">1.1 Introduction, The Cell Theory, Prokaryotic and Eukaryotic cells
1.2 Cell cycle and Apoptosis.
1.3 Cell division: Mitosis and Meiosis with their significance.
2.1 Nucleus: Ultra structure, Nuclear envelope, Nuclear pore complex, DNA packaging in Eukaryotes</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Cell Organelles

Unit III: Research technique in Biology
1. Sub Cellular Structures and Cell Membrane</td><td rowspan="2">2.2Mitochondria: Ultrastructure, and its Role.
2.3Chloroplasts: Ultrastructure, and its Role.
2.4 Ribosomes: Structure and Functions of Prokaryotic and Eukaryotic organisms.
1.1. Endoplasmic Reticulum, Golgi body and Lysosomes: Structure and Role.
1.2 Peroxisomes and Glyoxysomes: Structure and Role.</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

				1.3 Cell membrane: Structure, Fluid Mosaic Model, Role. 1.4 Types of membranes as per permeability.
Month: October			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit IV: Research Techniques in Biology	2.1 Principles of microscopy, Light, Fluorescence and Electron microscopy (EM)- SEM, TEM. 2.2 Colorimetry, Spectrophotometry, Micrometry, Photomicrography, 2.3 Intellectual property right (IPR) – Concept and Importance, concept of Plagiarism 2.4 Patents – Objectives, Types of Patents, Procedure and Working
12	20	32		

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss. Pranita C. Patil**

Program: **B.Sc I** **Semester: I**

Subject: **Botany** Paper No.: **II (SBOTO01)**

Course Title: **Biodiversity of Archegoniate- Bryophytes, Pteridophytes, Gymnosperms**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Bryophytes</td><td rowspan="2">1.1 General characters, Adaptation to land habit, Classification – as per G. M. Smith up to class.</td></tr>
<tr><td>4</td><td>16</td><td>20</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Bryophytes</td><td rowspan="2">1.2 Alternation of Generation. Economic importance of bryophytes.</td></tr>
<tr><td>4</td><td>16</td><td>4</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Bryophytes</td><td rowspan="2">1.3 Morphology, anatomy and life cycle (Excluding developmental stages) of following type.
a. Hepaticopsida – Riccia
b.Anthocerotopsida – Anthoceros</td></tr>
<tr><td>4</td><td>16</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss. Pushpanjali Dodamani**

Program: **B.Sc I** Semester: **I**

Subject: **Botany** Paper No.: **II (SBOTO01)**

Course Title: **Biodiversity of Archegoniate- Bryophytes, Pteridophytes, Gymnosperms**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Pteridophytes</td><td rowspan="2">1.1 General characters, Classification – as per G. M. Smith up to class.
1.2 Alternation of Generation. Economic importance</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Pteridophytes</td><td rowspan="2">1.3 Morphology, anatomy and life cycle (Excluding developmental stages) of following type.
a. Lycopsida – Selaginella
b. Pteropsida – Pteris
1.4 Heterospory and seed habitat</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Gymnosperm :</td><td rowspan="2">2.1 General characters, Classification as per Sporne-1965, up to Class.
2.2 General characters of class with suitable example. Economic importance of gymnosperms.
2.3 Morphology and stem anatomy, Life Cycle (Excluding developmental stages) of following type Cycadopsida- Cycas</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss. Pranita C. Patil**

Program: **B.Sc II** Semester: **III**

Subject: **Botany** Paper No.: **V (SBOTO03)**

Course Title: **Taxonomy of Angiosperms and Embryology**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Plant embryology
1.Organization of Flower:</td><td rowspan="2">1.1: Concept of flower as a modified Shoot, Structure of typical flower.
1.2: Structure of typical androecium, Structure of tetrasporangiate anther and pollen grain.
1.3: Microsporogensis, pollen germination and structure of male gametophyte.
1.4: Structure of typical gynoecium: Structure of a typical ovule, Types of ovules.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Plant embryology
1.Organization of Flower

Unit II: Pollination and Fertilization</td><td rowspan="2">1.5: Megasporogenesis,structure of embryo sac:Monosporic (Polygonum) and Bisporic (Allium), Structure of female gametophyte.

2.1: Definition, Types and mechanism in Anemophily (Zea mays), Entomophily (Calotropis) and
Hydrophily (Vallisneria)
2.2: Fertilization: Entry of pollen tube, double fertilization and triple fusion. Significance of double fertilization.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>2.3: Structure and development of embryo in Monocotyledons.</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Pollination and Fertilization</td><td rowspan="2">2.4: Structure and development of embryo in Dicotyledons.
2.5: Development of endosperm, Types of endosperm- Nuclear, Helobial and Cellular
2.6: Polyembryony: Introduction, Types of polyembryony- True polyembryony (Cleavage and Adventive), False polyembryony.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss. Pushpanjali Y. Dodamani**

Program: **B.Sc II** Semester: **III**

Subject: **Botany** Paper No.: **V (SBOTO03)**

Course Title: **Taxonomy of Angiosperms and Embryology**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Palynology</td><td rowspan="2">1.1 Definition, applications and importance
1.2 Pollen structure - Polarity, symmetry, size and
shape, apertures, exine stratification</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Palynology

Unit II: Taxonomic literature</td><td rowspan="2">1.3 NPC system. Principles and general outline
1.1: Molecular system of classification- APG;
1.2: General information of Flora, Monograph,
References books, Research paper.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Taxonomic literature</td><td rowspan="2">1.3 Study of Plant families
a. Malvaceae
b. Meliaceae
c. Rubiaceae
d. Apocynaceae
e. Poaceae
f. Musaceae</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pranita C. Patil**

Program: **B.Sc III** Semester: **V**

Subject: **Botany** Paper No.: **X (SBOTO10)**

Course Title: **Microbiology, Plant Pathology and Biofertilizers**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I:
Microbiology</td><td rowspan="2">1.1: Methods in Microbiology: concept of staining – Bacterial stain (Gram stain), Sterilization Methods, Culture Media, Pure Culture Techniques
1.2: Recombination in Bacteria: Transformation and
Transduction
2.1 Importance of microbial genetics Applications of micro-organisms with reference to Synthesis of Antibiotics (Penicillin), Organic Acids (Lactic Acid), Alcohol (Ethyl Alcohol)
2.2 Biopesticides</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Plant Pathology</td><td rowspan="2">1.1 Classification of Plant Diseases: on the basis of
Pathogens and Symptoms
1.2 Transmission of Pathogen- Air borne, Seed borne
and Soil borne
1.3 Prevention and Control: Physical, Chemical and
Biological Control, Role of Quarantine</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

<table>
<tr><td colspan="3"></td><td></td><td>1.4 Study of Plant Diseases
i) Little leaf of Brinjal,
ii) Citrus Canker
iii) Yellow Vein Mosaic of Bhendi
iv) White Rust of Crucifers
v) Tikka Disease of ground nut</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Biofertilizer</td><td rowspan="2">2.1 Introduction, Importance, types and study of –
a) Bacterial fertilizers: Rhizobium, Azotobacter,
Phosporous Solubalizing Bacteria
b) Blue green Algae:, Cyanobacteria (BGA): Nostoc, Anabaena.
c) Mycorrhizal association: VAM
d) Fungal: Trichoderma
2.2 Organic manures –
a) Farm Yard Manure, Green manure, Compost
b) Vermicomposting and Vermi-wash</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pushpanjali Y. Dodamani**

Program: **B.Sc III** Semester: **V**

Subject: **Botany** Paper No.: **XII (SBOTO12)**

Course Title: **Horticulture and Gardening**

<table>
<tr><td colspan="3">Month: August</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Horticultural Product and Management of Pest and Diseases</td><td rowspan="2">1.1 Floriculture:
a) Introduction, Cultivation of important cut flowers and management of important pests and diseases: Rose, Gerbera and Marigold.
b) Flower arrangements, Packing and Marketing of
cut flowers.
1.2 Olericulture:
Introduction; Cultivation and management of
important vegetable crop: Capsicum, Tomato
2.1 Pomoculture:
a) Introduction, cultivation of economically important
fruits.</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3"></td><td>Unit II: Fruit preservation technology:</td><td>2.2 Preservation techniques of Fruits
a) Physical - Drying, freezing, heat,
b) Chemical - sugar, salt, chemical preservatives</td></tr>
<tr><td colspan="3">Month: September</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td>Unit III: Nursery</td><td></td></tr>
</table>

<table>
<tr><td>12</td><td>20</td><td>32</td><td></td><td>2.1: Definition, objectives and scope, Infrastructure
for nursery
2.2: Propagation Practices: Sexual and Asexual Vegetative:
i) Cutting – Definition, Stem cutting (Hard wood
stem and soft wood stem), Use of PGR’s for rooting
ii) Layering –Definition, Simple layering, Air layering
iii) Grafting – Definition, Whip grafting, Approach grafting
iv) Budding: Definition, T-budding, Patch budding</td></tr>
<tr><td colspan="3">Month: October</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Gardening</td><td rowspan="2">1.1 Definition, scope, and objectives
1.2 Indoor Garden – Indoor plants, bottle garden(Terrarium), Broken pots garden, dish garden, hanging basket, Bonsai, Vertical Garden
1.3 Outdoor Garden – Lawns, Preparation of lawn,
lawn types, Rockery, Terrace Garden, and Polyhouse
1.4 Important Aesthetic Gardens of India:
i) Mughal
Garden, Delhi
ii) Brindavan Garden, Mysore</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha A. Shendure**

Program: **B.Sc I** Semester: **II**

Subject: **Botany** Paper No.: **III (SBOTO02)**

Course Title: **Plant Ecology**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Ecological factors and Adaptations</td><td rowspan="2">1.Introduction, Definition and Scope of Ecology</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Ecological Factors</td><td rowspan="2">2.1 Edaphic factors – Soil: Origin and formation. Composition- water, air, temperature, organic matter and microbes.
2.2 Climatic factors - Light, Temperature, Precipitation, atmospheric humidity and Rainfall .
2.3 Ecological adaptations – Hydrophytes, Xerophytes, Epiphytes and Parasites</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Ecological Succession</td><td rowspan="2">Introduction, Process of succession, Types of succession - Hydrosere and Xerosere.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Ecological Interaction</td><td rowspan="2">Intraspecific interaction (Cooperation, communication and competition), Interspecific interaction (Symbiosis , Commensalism , Parasitism and Predation)</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Bhairu N. Shinde**

Program: **B.Sc I** Semester: **II**

Subject: **Botany** Paper No.: **III (SBOTO02)**

Course Title: **Plant Ecology**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Ecosystem and Phytogeography</td><td rowspan="2">1.1 Introduction, Composition-Abiotic and Biotic components.
1.2 Types of ecosystems: Aquatic (Pond ecosystem) and Terrestrial (Grassland ecosystem)
1.3 Food chain and web.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">UnitII: Biogeochemical cycles</td><td rowspan="2">2.1 Introduction, Phosphorus and Nitrogen cycle</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Phytogeographical regions of India</td><td rowspan="2">(as per Chatterjii and Mani).</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pranita C. Patil**

Program: **B.Sc I** Semester: **II**

Subject: **Botany** Paper No.: **IV (SBOTO02)**

Course Title: **Plant Taxonomy**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: 1. Introduction , Importance of Taxonomy.</td><td rowspan="2">1. Introduction, Importance of Taxonomy.</td></tr>
<tr><td>4</td><td>16</td><td>20</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Functions of taxonomy:</td><td rowspan="2">2.1 Identification, Nomenclature, Binomial Nomenclature.
2.2 Salient features of International Code of Botanical Nomenclature (ICBN).</td></tr>
<tr><td>4</td><td>16</td><td>20</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Herbarium:</td><td rowspan="2">3.1 Introduction, Steps in herbarium preparation.
3.2 Role and significance.</td></tr>
<tr><td>4</td><td>16</td><td>20</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Botanical Gardens:</td><td rowspan="2">4.1 Introduction, Role, and Significance.
4.2 Study of Sir J.C.Bose Botanical Garden, Culcutta
4.3 Lead Botanical Garden, Shivaji University, Kolhapur.</td></tr>
<tr><td>4</td><td>16</td><td>20</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pushpanjali Y Dodamani**

Program: **B.Sc I** Semester: **II**

Subject: **Botany** Paper No.:**IV (SBOTO02)**

Course Title: **Plant Taxonomy**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Classification of angiosperms</td><td rowspan="2">1.1 Salient features of Angiosperms.
1.2 Types of classification: Natural, Artificial, Phylogenetic.
1.3 Outline, merits and demerits of Bentham and Hooker’s classification.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Study of Angiospermic families:</td><td rowspan="2">Morphological, floral and distinguishing characters of following families with examples of plants of economic importance.
a. Caesalpiniaceae.
b. Solanaceae.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Study of Angiospermic families:</td><td rowspan="2">c. Nyctaginaceae.
d. Amaryllidaceae</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha N. Shendure**

Program: **B.Sc II** Semester: **IV**

Subject: **Botany** Paper No.: **VIII (SBOTO04)**

Course Title: **Plant Metabolism**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Growth and Development</td><td rowspan="2">1.1 Definition, Region of growth, Phases of growth, growth curve, Grand period of growth.
1.2: Plant growth regulators:
Physiological (Practical applications) roles of growth regulators –Auxins, Gibberellins and Abscisic acid.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Growth and Development</td><td rowspan="2">1.3: Plant responses to light and temperature –
a) Photoperiodism: Concept, Definition, Photoperiodic classification of plants- LDP, SDP, DNP.
b) Mechanism of photoperiodism: Photoperiodic induction, perception of stimulus, role of Phytochrome, flowering hormone-Floregin concept
1.4: Vernalization: Concept, mechanism and its significance</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Seed Dormancy and Germination</td><td rowspan="2">2.1: Concept of dormancy
2.2: Causes of dormancy
2.3: Methods of breaking of seed dormancy- Scarification(Mechanical and Chemical Method) and Stratification.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Seed Dormancy and Germination</td><td rowspan="2">2.4: Seed germination- Introduction and types (Epigeal, Hypogeal and Viviparous).
2.5: Factors affecting seed germination
2.6: Biochemical changes during seed germination</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**
Name of Teacher: **Dr. Bhairu N. Shinde**
Program: **B.Sc II** Semester: **IV**
Subject: **Botany** Paper No.: **VII (SBOTO04)**
Course Title: **Plant Anatomy**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Introduction and scope of Plant Anatomy</td><td rowspan="2">1.1: Internal organization of Plant body.
1.2: Types of cells and tissues
1.3: Applications in systematics, forensics and
pharmacognosy.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II:
Tissue and Tissue System</td><td rowspan="2">2.1: Meristem:
a) Introduction, Characteristics and Classification of meristems based on position, origin and function.
b) Theories of structural development-
i) Apical cell theory
ii) Histogen theory
iii) Tunica Corpus theory</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Tissue and Tissue System</td><td rowspan="2">2.2: Permanent tissue:
i) Simple tissue- Parenchyma, Collenchyma
and Sclerenchyma
ii) Complex tissue: Xylem and Phloem</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Tissue and Tissue System</td><td rowspan="2">2.3: Types of Vascular bundles
2.4: Epidermal tissue system
2.5: Secretary tissue system
2.6: Mechanical tissue system</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**
Name of Teacher: **Miss. Pranita C patil**
Program: **B.Sc II** Semester: **IV**
Subject: **Botany** Paper No.: **VII (SBOTO04)**
Course Title: **Plant Anatomy**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Primary and secondary structure of plant body</td><td rowspan="2">1.1 Primary structure of Monocotyledon and Dicotyledon root, stem and leaf.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Primary and secondary structure of plant body</td><td rowspan="2">1.2: Normal secondary growth in Dicotyledon root and stem.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Primary and secondary structure of plant body</td><td rowspan="2">1.3: Anomalous secondary growth in Bignonia (Dicot) and Dracaena (Monocot) stem.</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit IV: Primary and secondary structure of plant body</td><td rowspan="2">1.4: Periderm and Lenticel</td></tr>
<tr><td>4</td><td>-</td><td>4</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pushpanjali Y Dodamani**

Program: **B.Sc II** Semester: **IV**

Subject: **Botany** Paper No.: **VIII (SBOTO04)**

Course Title: **Plant Metabolism**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Enzymes</td><td rowspan="2">1.1: Introduction
1.2: Classification and Nomenclature of enzymes
1.3: Structure and properties of enzymes
.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Enzymes</td><td rowspan="2">1.4: Mechanism of enzyme action- Lock and Key hypothesis and Induced fit hypothesis
1.5: Factors affecting enzyme activity temperature and pH.
1.6: Enzyme inhibition</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Nitrogen Metabolism</td><td rowspan="2">2.1: Introduction
2.2: Biological Nitrogen Fixation- Asymbiotic and
Symbiotic
2.3: Mechanism of Nitrogen Fixation</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Nitrogen Metabolism</td><td rowspan="2">2.4: Nitrate reduction
2.5: Ammonia assimilation
2.6: nif genes.</td></tr>
<tr><td>8</td><td>16</td><td>24</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)

DEPARTMENT OF BOTANY

Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Megha N. Shendure**

Program: **B.Sc III** Semester: **VI**

Subject: **Botany** Paper No.: **XIII (SBOTO13)**

Course Title: **Plant Biochemistry and Molecular Biology**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Carbohydrates</td><td rowspan="2">Introduction and Classification of carbohydrates.
1.2 Structure and Properties of-
a) Monosaccharides (Pentose: Ribose, Hexose: Glucose),
b) Oligosaccharides (Sucrose), c) Polysaccharides (starch).
1.3 Isomerism: Types of Isomers (Structural and Stereoisomer)
1.4 Significance of carbohydrates</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Lipids</td><td rowspan="2">2.1 Introduction, General Structure, properties and classification of Lipids
2.2 Structure and properties of Saturated Fatty Acids (Stearic and Palmitic acid) and Unsaturated Fatty Acids
(Oleic acid, Linoleic acid)
2.3 Significance of Lipids</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Proteins</td><td rowspan="2">ntroduction, structure, Properties, Characteristics and classification of Amino acids
1.2. Brief Outline of biosynthesis of Amino acid: Proline</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

				1.3. General Structure, Classification of Protein 1.4. Protein Biosynthesis in Eukaryotes: Transcription and translation
Month : March			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit IV: Nucleic Acids	Introduction, Composition and Structure
12	20	32		2.2 DNA: Watson and Crick Model, Forms of DNA (A, B and Z) 2.3 DNA Replication in Eukaryotes 2.4 RNA: Types, structure and role of RNA's 2.5 Regulation of Gene expression- Operon Concept.

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Dr. Bhairu N. Shinde**

Program: B.Sc **III** Semester: **VI**

Subject: **Botany** Paper No.: **XVI (SBOTO16)**

Course Title: **Herbal Drug Technology and pharmacognosy**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Herbal Medicines</td><td rowspan="2">1.1 Definition, Importance of herbal medicines
1.2 Classification of crude drugs: Taxonomical, morphological, and Chemical
1.3 Identification, authentication, collection, processing, and storage of medicinal plants.
1.4 Introduction to general methods of extraction, isolation, and purification of Phyto constituents</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Herbal cosmetology</td><td rowspan="2">2.1 Applications of herbs in cosmetics: Shampoo (Sapindus laurifolius, Acacia concinna), hair dye (Lawsonia inermis)
2.2 Facemask (Santalum album), bath oil (Rosa indica), perfume (Jasminum sambac).</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Pharmacognosy</td><td rowspan="2">1.1 Pharmacognosy: Introduction And, Definition
1.2 Medicinal uses of Tulsi, Ginger, Methi, Avala.
1.3 Adulteration of drugs of natural origin: Evaluation by morphological, Microscopic, Chemical, Physical, Chromatographical, Spectrophotometric.
1.4 Plant antioxidants: Properties of Antioxidants, Vitamins (C and E)</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Plant Pharmaceuticals</td><td rowspan="2">1.1 Concept and advantages, Types of pharmaceutical products: Churna, Asava and Arishta, Drug plants with reference to botanical source, active principles and</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

				medicinal uses of *Adathoda*, *Tinospora* and *Asparagus.* 2.2 Phytochemicals–Alkaloids and Phenols 2.3 Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; *Catharanthus roseus* (cardiotonic), *Withania somnifera* (drugs acting on nervous system), *Boswellia serrata* (anti-rheumatic) and *Centella asiatica* (memory booster).

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Pranita C. Patil**

Program: B.Sc **III** Semester: **VI**

Subject: **Botany** Paper No.: **XIV (SBOTO14)**

Course Title: **Bioinformatics, Biostatistics and Economic Botany**

Month: December			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit I: Bioinformatics	Introduction, Aim, Scope and Branches of Bioinformatics 1.2 Biological Databases: Classification Format and Retrieval system of Biological Database, National Center for Biotechnological Information (NCBI), Basic Local Alignment Search Tool (BLAST) 1.3 Protein Information Resource (PIR) - Concept, Resources, Databases and Data Retrieval 1.4 Applications of Bioinformatics- Molecular Phylogeny (Concept, Methods, Analysis and Consistency
12	20	32		
Month: January			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit II: Biostatistics	2.1 Introduction, terminology. 2.2 Collection and presentation of data: Types of Methods Sampling method- simple random, stratified and systematic sampling, graphical representation- Histogram and polygon. 2.3 Measures of central tendency: Arithmatic mean, Range, Mean, Mode, Median, Deviation, Mean deviation, Standard Deviation, Coefficient of Variation. 2.4 Statistical methods for testing the hypothesis i) T-test ii) Chi-square test.
12	20	32		
Month: February			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit III: Economic Botany I	1.1: Concept of center of origin, their importance with reference to Vavilov's work. 1.2: Study of following economical important plant with reference to origin, morphology, parts used and uses.
12	20	32		

<table>
<tr><td></td><td></td><td></td><td></td><td>1.2a Cereals: Wheat and Rai
1.2b Legumes: Gram and Soybean.
1.2c Oils and Fats: Ground nut and Sunflower</td></tr>
<tr><td colspan="3">Month : March</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Economic Botany II</td><td rowspan="2">2.1 Spices and Condiments - Clove and Black pepper.
2.2 Beverages – Tea and Coffee
2.3 Fiber yielding Plants - Cotton and Coconut plant</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

Name and Signature of Teacher **Principal**

MAHAVIR MAHAVIDYALAYA, KOLHAPUR (Autonomous)
DEPARTMENT OF BOTANY
Annual Teaching Plan

Academic year: **2024-2025**

Name of Teacher: **Miss Pushpanjali Y. Dodamani**

Program: **B.Sc III** Semester: **VI**

Subject: **Botany** Paper No.: **XV (SBOTO15)**

Course Title: **Plant Biotechnology, Plant Systematics and Paleobotany**

<table>
<tr><td colspan="3">Month: December</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit I: Plant Tissue Culture</td><td rowspan="2">1.1 Principles and Terminologies, Laboratory Requirement (Conditions and Instruments), Culture Media, Totipotency and Cellular Differentiation,
1.2 Micro propagation: Stages of Micro propagation-
Callus formation, Root Initiation, Shoot Initiation, Primary and Secondary Hardening, Advantages and disadvantages of plant tissue culture
1.3 Embryogenesis: Protoplast culture, Cybrid
1.4 Somaclonal Variations</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: January</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit II: Recombinant DNA Technology</td><td rowspan="2">2.1. Introduction, Principles and enzymes involved in DNA technology.
2.2. Cloning Vectors:
a) Prokaryotic- Plasmid, Lambda phage and Cosmid.
b) Eukaryotic-YAC (Yeast Artificial chromosomes).
2.3Southern blotting and Northern blotting techniques and its applications, Molecular Probes
2.4. DNA Fingerprinting, Molecular DNA Markers (RAPD, RFLP)
2.5 PCR, DNA sequencing and Concept of Gene bank.</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
<tr><td colspan="3">Month: February</td><td>Module</td><td>Subunit planned</td></tr>
<tr><td>Lecture</td><td>Practical</td><td>Total</td><td rowspan="2">Unit III: Plant systematic</td><td rowspan="2">1.1 The general account of origin of Angiosperms (with reference to Gnetalean theory)
1.2 Classification system of Takhtajan</td></tr>
<tr><td>12</td><td>20</td><td>32</td></tr>
</table>

				1.3 Morphological and floral characters, distinguishing characters and economic importance of following families. a) Anacardiaceae, b) Fabaceae, c) Acanthaceae d) Euphorbiaceae e) Cucurbitaceae f) Myrtaceae g) Amaranthaceae
Month : March			**Module**	**Subunit planned**
Lecture	Practical	Total	Unit IV: Paleobotany	2.1 General account, Geological time scale, process of fossilization, Types of fossils. 2.2 Study of following form genera with reference to systematic position, external morphology, and affinities: a) Lyginopteris b) Enigmocarpon. 2.3 Application of palaeobotany: Role of microfossil in oil and coal exploration
12	20	32		

Name and Signature of Teacher **Principal**