Digambarrao Bindu Arts Comm., & Science College, Bhokar, Dist Nanded

Annual Teaching Plan for 2017 - 2018

Work Distribution

Class	Teachers			
	Dr. S. V. Tawade		Dr. N. A. Dhole	
	Theory	Practicals	Theory	Practicals
B.Sc. I Sem I	Paper I	Paper V	Paper II	Paper V
B.Sc. I Sem II	Paper IV		Paper III	
B.Sc. II Sem III	Paper VI	PAPER – X	Paper VII	paper XI
B.Sc. II Sem IV	Paper IX		Paper VIII	
B.Sc. III Sem V	Paper XIII-A	PAPER- XVII	Paper -XII	PAPER-XVI
B.Sc. III Sem VI	Paper-XV-A		Paper XIII	
	SECB –I- A SECB–IV -A		SECB –I- B SECB- III-B	

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Department of Botany

TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. S. V. Tawade**

Class: B.Sc-I Sem-I

Paper No.: I Title : DIVERSITY OF MICROBES (Viruses, Bacteria, Fungi, Lichens)

Unit No. / Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
Unit I July	**VIRUSES and Mycoplasma** General characters of viruses Classification of viruses based on host. structure of Plant viruses (TMV), Transmission of viruses Economic importance Yellow vein mosaic of Bhendi & Bean mosaic Mycoplasma: General characters,Systematic position & structrue, Little leaf of Brinjal.	*(10 periods)*	
Unit II Aug.	**BACTERIA** **Archebacteria:** Habit, forms & economic importance. **Bacteria:** General characters,Ultra structure of bacterial cell,mode of nutrition Asexual reproduction (By binary fission) Sexual reproduction (By conjugation) . cyanobacteria : Salient features of cyanobacteria. Systematic position, habitat, distribution, structure and reproduction in ***Nostoc,*** Role of bacteria and cyanobacteria in agriculture	*(13 periods)*	
Unit III Sept.	**FUNGi**: General characters of Fungi Classification of Fungi (as per Alexopolous and Mims,1979) type study: Systematic position, occurrence, structure of mycelium, reproduction and graphic life cycle of following fungal types ***Albugo & Eurotium***	*(10 periods)*	
Unit IV Oct.	**FUNGI AND LICHENS** **Fungi:** Systematic position, occurrence, structure of mycelium, reproduction and graphic life cycle of **Puccinia & Alternaria,** Role of fungi in industries medicine food & Agriculture, **Lichens:** General characters of lichens, classification types & Economic importance.	*(12 periods)*	

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TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. S. V. Tawade**

Class: B.Sc I Sem-II

Paper No.: IV Title : Genetics and Plant Breeding

Unit No. month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
Unit I Nov.	Genetics I: Genetic inheritance – mendelism, mendels law of inheritance explanation & ex. Of Monohybrid cross, dihybrid, back cross& test cross. Gene interaction & epistasis (Allelic & non Allelic) explanation & ex. Of complementary gene action (9:7), Complimentary gene action (9:3:4), epistatic gene action (12:3:1) and duplicate gene action (15:1) sex determination: Discovery of sex chorosomes, chromosomal theory of sex determination – in insects (XO-XX), Birds (ZW-ZZ method), Animals (Drosophila and Man), Plants (Melandrium).	13	
Unit II Dec.	Genetics-II : Sex linked inheritance- Defination classification (x-linked, y-linked and xylinked), Sex linked inheritance in Drosophila(White eye colour) and Sex linked inheritance in Man (Hemophilia, Colour blidness) Holandric gene – hypertrochosis and sex linked in heritance in Birds - Barred feathers. Chromosomal Aberrations (Numerical) : Polyploidy (Haplodis, diploids, Triploids, Tetraploids and polyploids) Euploidy-Autoployploidy and Allopolyploidy with reference to Raphanobrassica and Hexaploid wheat, Aneuploidy (hyper and hypoploidy), Human syndromes (Autosomal and Sex – chromosomal syndromes) – Down's syndromes, Turmer's syndrome and klinfelters syndromes.	12	
Unit III Jan.	Plant Breeding : Introduction, objective of plant breeding, Methods of plant breeding : Selection–Mass selection, Pure line selection, clonal selection,Hybridization- defination, objectives,various steps and application, Heterosis- Defination ; effects,utlization and limitation.	10	
Unit IV Feb	Plant Breeding : Plant Introduction and Acclimatization: introduction, types, advantages and disadvantages,Mutational breeding: objectives procedure and application, methods of mutational breeding with reference to groundnut, Male sterility, Genetic male sterility, Cytoplasmic male sterility.	10	

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TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. S. V. Tawade**

Class: B.Sc II Sem-III

Paper No.: VI Title : MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

Unit No. Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**MORPHOLOGY OF ANGIOSPERMS: Root:** Definition, characters, types (tap root and adventitious) and functions. **Stem:** Definition, characters, modifications (stem tendril, phylloclade, tuber, rhizome, corm and runner) and functions. **Leaf:** Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation- definition, types (reticulate, parallel), Phyllotaxy, **Inflorescence:** Definition, types- Racemose (characters), Cymose (characters), **Flower:** Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), androecium (parts of a stamen), gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) **Fruit:** Definition, types (true, false), forms- simple (dry, legume, fleshy, berry), aggregate (etaerio of berries), composite (sorosis)	10	
UNIT-II July	**TAXONOMY OF ANGIOSPERMS:** Introduction, scope and objectives of angiosperm taxonomy, binomial nomenclature, taxonomic ranks, types of classification (artificial, natural and phylogenetic), salient features of Bentham & Hooker and Engler & Prantl's system of classification with merits and demerits	10	
UNIT-III Aug.	**STUDY OF FAMILIES-I:** Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit) floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Annonaceae, Brassicaceae, Malvaceae, Meliaceae, Caesalpinaceae, Fabaceae, Apiaceae.**	13	
UNIT-IV Sept.	**STUDY OF FAMILIES-II** *:* Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit), floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Asteraceae, Solanaceae, Euphorbiaceae, Lamiaceae, Liliaceae and Poaceae**	12	

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TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. Tawade S. V.**

Class: B.Sc II Sem-IV

Paper No.: IX Title : ECOLOGY AND ENVIRONMENTAL BIOLOGY

Unit No. month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec.	**ECOLOGICAL FACTORS:** Introduction-Definition of ecology and environment, divisions, fields and scope of ecology, Environmental or ecological factors- Climatic factors (Atmosphere, atmospheric humidity, light and temperature), Edaphic factor (Soil components, soil formation and soil profile)	10	
UNIT-II Jan.	**ECOLOGICAL ADAPTATIONS IN PLANTS:** Morphological, anatomical and physiological responses of plants to water, Morphological and anatomical adaptation in Hydrophytes (Hydrilla stem and Nymphea petiole), Xerophytes (Casuarina stem and Nerium Leaf), Halophytes (General characters)	10	
UNIT-III Feb.	**COMMUNITY ECOLOGY:** Community Ecology- Community characteristics, frequency, density, life forms and ecological succession (Hydrosere), analysis of plant community (quadrant method), Ecosystem- Introduction and structure (Abiotic and biotic components) of ecosystem, Pond and grassland ecosystems, Energy flow in an ecosystem, Food chain and food web, ecological pyramids.	13	
UNIT-IV March	**ENVIROMENTIAL BIOLOGY:** Biogeochemical cycles- Water and Nitrogen cycle, Pollution- Causes, effect and control measures of water, soil and air pollution, Soil erosion- Types, methods of soil conservation, Bio geographical regions of India, Aforestation, Deforestation and Chipko movement.	12	

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TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. Tawade S. V.**

Class: B.Sc III Sem-V

Paper No.: XIII Title : PLANT PATHOLOGY-I

Unit No. Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**FUNDAMENTALS OF PLANT PATHOLOGY:** Scope, importance, history and advancement of plant pathology, classification of plant diseases on the basis of causal organism and symptoms, field and laboratory diagnosis- Isolation of plant pathogens from infected plant parts, soil and air, Pure culture technique, Koch's postulates for pathogenicity.	11	
UNIT-II July	**PLANT DISEASE DEVELOPMENT:** Disease development- Mode of entry of pathogens (through stomata, wounds, root hairs and buds), Factors affecting disease development- Temperature, moisture, wind and soil pH, Dispersal of plant pathogens (by air, water, insects and animals), chemical weapons of pathogen: enzymes, toxins and growth regulators.	11	
UNIT-III Aug	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Green ear of Bajra, leaf spot of tomato, Grain smut of Jowar, Red rot of Sugarcane, Angular leaf spot of cotton, , Bacterial blight of Pomegranate, Anthracnose of mango	12	
UNIT-IV Sept.	**PLANT DISEASES-II:** Symptoms, causal organisms, disease cycle and control measures of White rust of Mustard, Whip smut of Sugarcane, Powdery mildew of pea, Leaf spot of Turmeric (*Colletotrichum capsci*), Citrus canker, Sigatoka disease of Banana, leaf blight of Rice.	11	

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TEACHING PLAN: 2017-18

Name of The Teacher: **Dr. ~~Tawade S. V.~~** Dhole N.A.

Class: B.Sc III Sem-VI

Paper No.: XIV Title : Plant Metabolism, Biochemistry and Biotechnology

Unit No. / month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec.	**PHOTOSYNTHESIS AND RESPIRATION:** **Photosynthesis:** Introduction, significance, ultra structure of chloroplast, photosynthetic pigments, concepts of two Photo systems, Mechanism of photosynthesis, Light reaction, Hill reaction, Cyclic and Non cyclic photophoshorylation, Dark phase, Calvin cycle (C3) and Hatch and Slack (C4) pathway, CAM pathway **Respiration:** Introduction, significance, ultra structure of mitochondria, structure and functions of ATP, **Types of respiration**: Aerobic respiration- Glycolysis, Kreb's cycle, Electron Transport System. Anaerobic respiration- Fermentation (alcoholic and lactic acid)	11	
UNIT-II Jan.	**ENZYMES AND NITROGEN METABOLISM:** **Enzymes:** Introduction, nomenclature and classification (IUB), mechanism of enzyme action (lock and key model, induced fit model), Concept of holoenzyme, mechanism of regulation of enzyme activity-Feedback and allosteric regulation. **Nitrogen metabolism:** Introduction, sources and forms of nitrogen, types of nitrogen fixationphysical and biological (symbiotic and asymbiotic), Ammonification, nitrification and denitrification	11	
UNIT-III Feb.	**BIOTECHNOLOGY:** **Tissue culture:** Introduction and basic aspects of tissue culture, media, culture techniques, cellular totipotency. **Applications of tissue culture:** Micropropagation, Production of disease free plants, production of secondary metabolites, Anther culture and production of haploids, protoplast culture and somatic hybridization, synthetic seeds	12	
UNIT-IV March	**GENETIC ENGINEERING:** Introduction, tools and techniques of recombinant DNA technology, Cloning vectors, Gene cloning, Genomic library and cDNA library, *Agrobacterium* mediated gene transfer, transgenic plants. **Bioinformatics:** Introduction, Biological database, NCBI, BLAST.	11	

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Name of The Teacher: **Dr. Tawade S. V.**

Class: B.Sc III Sem-VI

Paper No.: XV Title : PLANT PATHOLOGY-II

Unit No. / month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec.	**AEROBIOLOGY AND SEED PATHOLOGY:** Aerobiology- Definition, scope and importance and disease forecasting, Seed pathology- Definition, seed borne pathogens (external and internal) detection of seed borne pathogens by blotter paper and agar plate methods, seed treatment (hot water, solar, chemical) and seed certification.	11	
UNIT-II Jan.	**DEFENSE MECHANISM AND PLANT DISEASE MANAGEMENT:** Structural (pre-existing and Post infectional) and biochemical defense-pre-existing and Post infectional (phytoalexins) Exclusion and eradication, Chemical control- General account of Sulphur, Copper, systemic fungicides and antibiotics, Integrated pest management.	11	
UNIT-III Feb	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Tikka disease of groundnut, Ergot of Bajra, Loose smut of Wheat, Rust of Jowar, Phanerogamic parasites(Cuscuta), Leaf curl of tomato.	11	
UNIT-IV March	**PLANT DISEASES-II** Symptoms, causal organisms, disease cycle and control measures of Downy mildew of Grape, Stem rust of Wheat, Wilt of Tur, late blight of Potato, Grassy shoot of Sugarcane, Papaya mosaic, Rust of Soybean, Leaf spot of cabbage.	12	

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Name of The Teacher: **Dr. Tawade S. V.**

Class: B.Sc II Sem-III

Paper No.: SECB-IA Title : MEDICINAL PLANT PRODUCT PREPARATION SKILL

Unit No. month.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I July	**MEDICINAL PLANTS:** Introduction, Definitions, Scope and Importance, Concept of active principles	6	
UNIT-II Aug.	**STUDY OF MEDICINAL PLANTS:** Description, Identification and Classification, medicinal uses of locally available medicinal plants (Awla, Adulsa, Ginger)	15	
UNIT-III Sept.	**PRACTICALS ON MEDICINAL PLANT PRODUCT PREPARATION:** Preparation of Awla candy, Awla masticator (Awla supari), Adulsa syrup, Ginger syrup and cake, Visit to a production industry in nearby area (Students are expected to prepare a model of production industry,	8	

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Name of The Teacher: **Dr. ~~Tawade~~ S. V.** --Bhole N.A.----

Class: B.Sc III Sem-VI

Paper No.: SECB –IVB Title :– HERBAL DRUG TECHNOLOGY

Unit No. / month		Planning Expected Period	Executions Actual No. Period
UNIT-I Dec.	1.0 **Introduction:** 1.1 Role of natural products in herbal medicine 1.2 General status and importance of herbal medicine 1.3 Safety of herbals / herbal pharmacovigilance 1.4 WHO policy on herbal medicine **2.0 Herbs as raw materials:** 2.1 Definition of herb , herbal medicine, herbal medicinal product, herbal drug preparation 2.2 Source of Herbs 2.3 Selection, identification and authentication of herbal materials drying and processing of herbal raw material	6	
UNIT-II Jan.	3.0 **Extraction of Herbal Materials** 3.1 Choice of solvent for extraction 3.2 Methods used for extraction and principles involved in extraction 4.0 Standardization of herbal formulations & herbal extracts 4.1 Standardization of herbal extracts as per WHO and cGMP guidelines 4.2 Physical, chemical. Spectral and toxicological standardization, qualitative and quantitative estimations exemplified by the method of preparation of at least two standardized extracts 4.3 Stability studies for extract 4.4 Predictable chemical and galenical changes	15	
UNIT-III Feb.	**Practicals:** 1. Qualitative and Quantitative Microscopic Examination: Microscopic evaluation of powder drugs and their mixtures with adulterants 2. Exercises based on standardization and quality control of plant drugs 3. Qualitative and Quantitative Estimation of Phytoconstituents 4. Determination of phytoconstituents in crude drugs and commercial herbal formulations 5. Pharmacopoeial evaluation of natural products	8	

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	6. Determination of ash values, extractive values, Swelling index and foaming index of crude drugs as per WHO Guidelines 7. Preparation of detailed monograph of at least one plant drug covering Pharmacognosy and Phytochemical investigation with its use in traditional system of medicine 8. Experiment on raw material standardization, purification of extracts with chromatographic techniques 9. Isolation of piperine from pepper 10. Isolation of Hespiridine from orange peel 11. Isolation & TLC of reserpine from Rauwolfia root 12. Isolation & TLC of Menthol from Mentha oil 13. Preparation and Evaluation of Herbal formulations		

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TEACHING PLAN: 2018-19

Name of The Teacher: **Dr. S. V. Tawade**

Class: B.Sc-I Sem-I

Paper No.: I Title : DIVERSITY OF MICROBES (Viruses, Bacteria, Fungi, Lichens)

Unit No / Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
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Unit II July	**BACTERIA** **Archebacteria:** Habit, forms & economic importance. **Bacteria:** General characters,Ultra structure of bacterial cell,mode of nutrition Asexual reproduction (By binary fission) Sexual reproduction (By conjugation) . cyanobacteria : Salient features of cyanobacteria. Systematic position, habitat, distribution, structure and reproduction in ***Nostoc,*** Role of bacteria and cyanobacteria in agriculture	*(13 periods)*	
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Name of The Teacher: **Dr. S. V. Tawade** ----------

Class: B.Sc I Sem-II

Paper No.: IV Title : Genetics and Plant Breeding

Unit No. Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
Unit I Dec.	Genetics I: Genetic inheritance – mendelism, mendels law of inheritance explanation & ex. Of Monohybrid cross, dihybrid, back cross& test cross. Gene interaction & epistasis (Allelic & non Allelic) explanation & ex. Of complementary gene action (9:7), Complimentary gene action (9:3:4), epistatic gene action (12:3:1) and duplicate gene action (15:1) sex determination: Discovery of sex chorosomes, chromosomal theory of sex determination – in insects (XO-XX), Birds (ZW-ZZ method), Animals (Drosophila and Man), Plants (Melandrium).	13	
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Name of The Teacher: **Dr. S. V. Tawade** ----------

Class: B.Sc II Sem-III

Paper No.: VI Title : MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

Unit No. Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**MORPHOLOGY OF ANGIOSPERMS: Root:** Definition, characters, types (tap root and adventitious) and functions. **Stem:** Definition, characters, modifications (stem tendril, phylloclade, tuber, rhizome, corm and runner) and functions. **Leaf:** Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation- definition, types (reticulate, parallel), Phyllotaxy, **Inflorescence:** Definition, types- Racemose (characters), Cymose (characters), **Flower:** Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), androecium (parts of a stamen), gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) **Fruit:** Definition, types (true, false), forms- simple (dry, legume, fleshy, berry), aggregate (etaerio of berries), composite (sorosis)	10	
UNIT-II July	**TAXONOMY OF ANGIOSPERMS:** Introduction, scope and objectives of angiosperm taxonomy, binomial nomenclature, taxonomic ranks, types of classification (artificial, natural and phylogenetic), salient features of Bentham & Hooker and Engler & Prantl's system of classification with merits and demerits	10	
UNIT-III Aug	**STUDY OF FAMILIES-I:** Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit) floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Annonaceae, Brassicaceae, Malvaceae, Meliaceae, Caesalpinaceae, Fabaceae, Apiaceae.**	13	
UNIT-IV Sept.	**STUDY OF FAMILIES-II** : Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit), floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Asteraceae, Solanaceae, Euphorbiaceae, Lamiaceae, Liliaceae and Poaceae**	12	

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TEACHING PLAN: 2018-19

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc II Sem-IV

Paper No.: IX Title : ECOLOGY AND ENVIRONMENTAL BIOLOGY

Unit No. / month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec	**ECOLOGICAL FACTORS:** Introduction-Definition of ecology and environment, divisions, fields and scope of ecology, Environmental or ecological factors- Climatic factors (Atmosphere, atmospheric humidity, light and temperature), Edaphic factor (Soil components, soil formation and soil profile)	10	
UNIT-II Jan.	**ECOLOGICAL ADAPTATIONS IN PLANTS:** Morphological, anatomical and physiological responses of plants to water, Morphological and anatomical adaptation in Hydrophytes (Hydrilla stem and Nymphea petiole), Xerophytes (Casuarina stem and Nerium Leaf), Halophytes (General characters)	10	
UNIT-III Feb.	**COMMUNITY ECOLOGY:** Community Ecology- Community characteristics, frequency, density, life forms and ecological succession (Hydrosere), analysis of plant community (quadrant method), Ecosystem- Introduction and structure (Abiotic and biotic components) of ecosystem, Pond and grassland ecosystems, Energy flow in an ecosystem, Food chain and food web, ecological pyramids.	13	
UNIT-IV March	**ENVIROMENTIAL BIOLOGY:** Biogeochemical cycles- Water and Nitrogen cycle, Pollution- Causes, effect and control measures of water, soil and air pollution, Soil erosion- Types, methods of soil conservation, Bio geographical regions of India, Aforestation, Deforestation and Chipko movement.	12	

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TEACHING PLAN: 2018-19

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc III Sem-V

Paper No.: XIII Title : PLANT PATHOLOGY-I

Unit No. / month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**FUNDAMENTALS OF PLANT PATHOLOGY:** Scope, importance, history and advancement of plant pathology, classification of plant diseases on the basis of causal organism and symptoms, field and laboratory diagnosis- Isolation of plant pathogens from infected plant parts, soil and air, Pure culture technique, Koch's postulates for pathogenicity.	11	
UNIT-II July	**PLANT DISEASE DEVELOPMENT:** Disease development- Mode of entry of pathogens (through stomata, wounds, root hairs and buds), Factors affecting disease development- Temperature, moisture, wind and soil pH, Dispersal of plant pathogens (by air, water, insects and animals), chemical weapons of pathogen: enzymes, toxins and growth regulators.	11	
UNIT-III Aug.	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Green ear of Bajra, leaf spot of tomato, Grain smut of Jowar, Red rot of Sugarcane, Angular leaf spot of cotton, , Bacterial blight of Pomegranate, Anthracnose of mango	12	
UNIT-IV Sept	**PLANT DISEASES-II:** Symptoms, causal organisms, disease cycle and control measures of White rust of Mustard, Whip smut of Sugarcane, Powdery mildew of pea, Leaf spot of Turmeric (*Colletotrichum capsci*), Citrus canker, Sigatoka disease of Banana, leaf blight of Rice.	11	

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TEACHING PLAN: 2018-19

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Name of The Teacher: **Dr. ~~Tawade~~ S. ~~V~~.** ----------

Class: B.Sc III Sem-VI

Paper No.: XIV Title : Plant Metabolism, Biochemistry and Biotechnology

Unit No. month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec	**PHOTOSYNTHESIS AND RESPIRATION:** **Photosynthesis:** Introduction, significance, ultra structure of chloroplast, photosynthetic pigments, concepts of two Photo systems, Mechanism of photosynthesis, Light reaction, Hill reaction, Cyclic and Non cyclic photophoshorylation, Dark phase, Calvin cycle (C3) and Hatch and Slack (C4) pathway, CAM pathway **Respiration:** Introduction, significance, ultra structure of mitochondria, structure and functions of ATP, **Types of respiration**: Aerobic respiration- Glycolysis, Kreb's cycle, Electron Transport System. Anaerobic respiration- Fermentation (alcoholic and lactic acid)	11	
UNIT-II Jan.	**ENZYMES AND NITROGEN METABOLISM:** **Enzymes:** Introduction, nomenclature and classification (IUB), mechanism of enzyme action (lock and key model, induced fit model), Concept of holoenzyme, mechanism of regulation of enzyme activity-Feedback and allosteric regulation. **Nitrogen metabolism:** Introduction, sources and forms of nitrogen, types of nitrogen fixationphysical and biological (symbiotic and asymbiotic), Ammonification, nitrification and denitrification	11	
UNIT-III Feb	**BIOTECHNOLOGY:** **Tissue culture:** Introduction and basic aspects of tissue culture, media, culture techniques, cellular totipotency. **Applications of tissue culture:** Micropropagation, Production of disease free plants, production of secondary metabolites, Anther culture and production of haploids, protoplast culture and somatic hybridization, synthetic seeds	12	
UNIT-IV March	**GENETIC ENGINEERING:** Introduction, tools and techniques of recombinant DNA technology, Cloning vectors, Gene cloning, Genomic library and cDNA library, *Agrobacterium* mediated gene transfer, transgenic plants. **Bioinformatics:** Introduction, Biological database, NCBI, BLAST.	11	

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	lipids **Secondary metabolites:** Biological functions of tannins, terpenoids, flavonoids, alkaloids, essential oils and organic acids		

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TEACHING PLAN: 2018-19

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc III Sem-VI

Paper No.: XV Title : PLANT PATHOLOGY-II

Unit No. Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec.	**AEROBIOLOGY AND SEED PATHOLOGY:** Aerobiology- Definition, scope and importance and disease forecasting, Seed pathology- Definition, seed borne pathogens (external and internal) detection of seed borne pathogens by blotter paper and agar plate methods, seed treatment (hot water, solar, chemical) and seed certification.	11	
UNIT-II Jan.	**DEFENSE MECHANISM AND PLANT DISEASE MANAGEMENT:** Structural (pre-existing and Post infectional) and biochemical defense-pre-existing and Post infectional (phytoalexins) Exclusion and eradication, Chemical control- General account of Sulphur, Copper, systemic fungicides and antibiotics, Integrated pest management.	11	
UNIT-III Feb	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Tikka disease of groundnut, Ergot of Bajra, Loose smut of Wheat, Rust of Jowar, Phanerogamic parasites(Cuscuta), Leaf curl of tomato.	11	
UNIT-IV March	**PLANT DISEASES-II** Symptoms, causal organisms, disease cycle and control measures of Downy mildew of Grape, Stem rust of Wheat, Wilt of Tur, late blight of Potato, Grassy shoot of Sugarcane, Papaya mosaic, Rust of Soybean, Leaf spot of cabbage.	12	

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TEACHING PLAN: 2018-19

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc II Sem-III

Paper No.: SECB-IA Title : MEDICINAL PLANT PRODUCT PREPARATION SKILL

Unit No. / Month	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I July	**MEDICINAL PLANTS:** Introduction, Definitions, Scope and Importance, Concept of active principles	6	
UNIT-II Aug	**STUDY OF MEDICINAL PLANTS:** Description, Identification and Classification, medicinal uses of locally available medicinal plants (Awla, Adulsa, Ginger)	15	
UNIT-III Sept.	**PRACTICALS ON MEDICINAL PLANT PRODUCT PREPARATION:** Preparation of Awla candy, Awla masticator (Awla supari), Adulsa syrup, Ginger syrup and cake, Visit to a production industry in nearby area (Students are expected to prepare a model of production industry,	8	

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Annual Teaching Plan for 2019 - 2020

Work Distribution

Class	Teachers			
	Dr. S. V. Tawade		Dr. N. A. Dhole	
	Theory	Practicals	Theory	Practicals
B.Sc. I Sem I	Paper II	Paper V	Paper I	Paper V
B.Sc. I Sem II	Paper IV		Paper III	
B.Sc. II Sem III	Paper VI	PAPER – X	Paper VII	paper XI
B.Sc. II Sem IV	Paper IX		Paper VIII	
B.Sc. III Sem V	Paper XIII	PAPER- XVII	Paper -XII	PAPER-XVI
B.Sc. III Sem VI	Paper-XV		Paper XIV	

SECB –I- A
SECB–IV -A

SECB –I- B
SECB- III-B

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc III Sem-VI

Paper No.: SECB –IVA Title :– FRUIT AND VEGETABLE PROCESSING

Unit No.		Planning Expected Period	Executions Actual No. Period
UNIT-I	Production and processing scenario of fruits and vegetables in India and World, Scope of fruit and vegetable preservation industry in India. present status, constraints and prospects, Overview of principles and preservation methods of fruits and vegetables (Physical and Chemical), Commercial processing technology of fruits and vegetables, Primary processing and pack house handling of fruits and vegetables; Peeling, slicing, cubing, cutting and other size reduction operations for fruits and vegetables, Minimal processing of fruits and vegetables Blanching operations and equipment.	6	
UNIT-II	Preparation and preservation of juices, squashes, syrups, sherbets, nectars, cordials, etc; Problems on squash and RTS; Processing and equipment for above products and FSSAI specification Preparation, preservation and machines for manufacture of crystallized fruits and preserves, jam, jelly and candies, Preparation, preservation and machines for manufacture of preserve, concentrate, fruit wine, pickles, sauce, paste, ketchup; toffee, cheese, lather, soup powders; FSSAI specification, Commercial processing technology of selected fruits and vegetables for production of various value added processed products.	15	
UNIT-III	**Practicals :** 1. Preparation of jam/ jelly from selected fruit 2. Preparation of RTS beverage e.g. Amala, Mango and Pineapple etc 3. Preparation of squash 4. Preparation of fruit candy 5. Preparation of fruit leather 6. Preparation of fruit toffee 7. Preparation of pickle 8. Preparation of banana and potato wafers 9. Visit to fruits and vegetables processing unit	8	

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc II Sem-III

Paper No.: SECB-IA Title : MEDICINAL PLANT PRODUCT PREPARATION SKILL

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I	**MEDICINAL PLANTS:** Introduction, Definitions, Scope and Importance, Concept of active principles	6	
UNIT-II	**STUDY OF MEDICINAL PLANTS:** Description, Identification and Classification, medicinal uses of locally available medicinal plants (Awla, Adulsa, Ginger)	15	
UNIT-III	**PRACTICALS ON MEDICINAL PLANT PRODUCT PREPARATION:** Preparation of Awla candy, Awla masticator (Awla supari), Adulsa syrup, Ginger syrup and cake, Visit to a production industry in nearby area (Students are expected to prepare a model of production industry,	8	

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc III Sem-VI

Paper No.: XV Title : PLANT PATHOLOGY-II

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec	**AEROBIOLOGY AND SEED PATHOLOGY:** Aerobiology- Definition, scope and importance and disease forecasting, Seed pathology- Definition, seed borne pathogens (external and internal) detection of seed borne pathogens by blotter paper and agar plate methods, seed treatment (hot water, solar, chemical) and seed certification.	11	
UNIT-II Jan	**DEFENSE MECHANISM AND PLANT DISEASE MANAGEMENT:** Structural (pre-existing and Post infectional) and biochemical defense-pre-existing and Post infectional (phytoalexins) Exclusion and eradication, Chemical control- General account of Sulphur, Copper, systemic fungicides and antibiotics, Integrated pest management.	11	
UNIT-III Feb	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Tikka disease of groundnut, Ergot of Bajra, Loose smut of Wheat, Rust of Jowar, Phanerogamic parasites(Cuscuta), Leaf curl of tomato.	11	
UNIT-IV March	**PLANT DISEASES-II** Symptoms, causal organisms, disease cycle and control measures of Downy mildew of Grape, Stem rust of Wheat, Wilt of Tur, late blight of Potato, Grassy shoot of Sugarcane, Papaya mosaic, Rust of Soybean, Leaf spot of cabbage.	12	

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Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc III Sem-V

Paper No.: XIII Title : PLANT PATHOLOGY-I

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**FUNDAMENTALS OF PLANT PATHOLOGY:** Scope, importance, history and advancement of plant pathology, classification of plant diseases on the basis of causal organism and symptoms, field and laboratory diagnosis- Isolation of plant pathogens from infected plant parts, soil and air, Pure culture technique, Koch's postulates for pathogenicity.	11	
UNIT-II July	**PLANT DISEASE DEVELOPMENT:** Disease development- Mode of entry of pathogens (through stomata, wounds, root hairs and buds), Factors affecting disease development- Temperature, moisture, wind and soil pH, Dispersal of plant pathogens (by air, water, insects and animals), chemical weapons of pathogen: enzymes, toxins and growth regulators.	11	
UNIT-III Aug	**PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Green ear of Bajra, leaf spot of tomato, Grain smut of Jowar, Red rot of Sugarcane, Angular leaf spot of cotton, , Bacterial blight of Pomegranate, Anthracnose of mango	12	
UNIT-IV Sept.	**PLANT DISEASES-II:** Symptoms, causal organisms, disease cycle and control measures of White rust of Mustard, Whip smut of Sugarcane, Powdery mildew of pea, Leaf spot of Turmeric (*Colletotrichum capsci*), Citrus canker, Sigatoka disease of Banana, leaf blight of Rice.	11	

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. Tawade S. V.** ----------

Class: B.Sc II Sem-IV

Paper No.: IX Title : ECOLOGY AND ENVIRONMENTAL BIOLOGY

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I Dec	**ECOLOGICAL FACTORS:** Introduction-Definition of ecology and environment, divisions, fields and scope of ecology, Environmental or ecological factors- Climatic factors (Atmosphere, atmospheric humidity, light and temperature), Edaphic factor (Soil components, soil formation and soil profile)	10	
UNIT-II Jan	**ECOLOGICAL ADAPTATIONS IN PLANTS:** Morphological, anatomical and physiological responses of plants to water, Morphological and anatomical adaptation in Hydrophytes (Hydrilla stem and Nymphea petiole), Xerophytes (Casuarina stem and Nerium Leaf), Halophytes (General characters)	10	
UNIT-III Feb	**COMMUNITY ECOLOGY:** Community Ecology- Community characteristics, frequency, density, life forms and ecological succession (Hydrosere), analysis of plant community (quadrant method), Ecosystem- Introduction and structure (Abiotic and biotic components) of ecosystem, Pond and grassland ecosystems, Energy flow in an ecosystem, Food chain and food web, ecological pyramids.	13	
UNIT-IV March	**ENVIROMENTIAL BIOLOGY:** Biogeochemical cycles- Water and Nitrogen cycle, Pollution- Causes, effect and control measures of water, soil and air pollution, Soil erosion- Types, methods of soil conservation, Bio geographical regions of India, Aforestation, Deforestation and Chipko movement.	12	

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. S. V. Tawade** ----------

Class: B.Sc II Sem-III

Paper No.: VI Title : MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
UNIT-I June	**MORPHOLOGY OF ANGIOSPERMS: Root:** Definition, characters, types (tap root and adventitious) and functions. **Stem:** Definition, characters, modifications (stem tendril, phylloclade, tuber, rhizome, corm and runner) and functions. **Leaf:** Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation- definition, types (reticulate, parallel), Phyllotaxy, **Inflorescence:** Definition, types- Racemose (characters), Cymose (characters), **Flower:** Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), androecium (parts of a stamen), gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) **Fruit:** Definition, types (true, false), forms- simple (dry, legume, fleshy, berry), aggregate (etaerio of berries), composite (sorosis)	10	
UNIT-II July	**TAXONOMY OF ANGIOSPERMS:** Introduction, scope and objectives of angiosperm taxonomy, binomial nomenclature, taxonomic ranks, types of classification (artificial, natural and phylogenetic), salient features of Bentham & Hooker and Engler & Prantl's system of classification with merits and demerits	10	
UNIT-III Aug	**STUDY OF FAMILIES-I:** Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit) floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Annonaceae, Brassicaceae, Malvaceae, Meliaceae, Caesalpinaceae, Fabaceae, Apiaceae.**	13	
UNIT-IV Sept	**STUDY OF FAMILIES-II** : Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit), floral formula, floral diagram, systematic position (as per Bentham & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Asteraceae, Solanaceae, Euphorbiaceae, Lamiaceae, Liliaceae and Poaceae**	12	

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TEACHING PLAN: 2019-20

Name of The Teacher: **Dr. S. V. Tawade** ----------

Class: B.Sc I Sem-II

Paper No.: IV Title : Taxonomy of Angiosperms

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
Unit I Dec	**Introduction** Aims of Taxonomy, Principles of Taxonomy, Identification, Nomenclature and Classification, Principles and rules of ICN (Rank of taxa, typification, author citation) Importance of Herbarium, important herbaria and botanical gardens of the India.	10	
Unit II Jan	**Plant Classification** Taxonomic hierarchy,Types of classification-artificial, natural and phylogenetic. Bentham and Hooker, Engler and Prantl (up to family level with reference to families mentioned in the syllabus).	11	
Unit III Feb	**Morphology of Angiosperms** Root: Definition, characters, types (tap root and adventitious) and functions. Stem: Definition, characters and functions. Leaf: Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation- definition, types (reticulate, parallel), Phyllotaxy. Inflorescence: Definition, types- Racemose (characters), Cymose (characters). Flower: Definition, symmetry, actinomorphic, 17 zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), Androecium (parts of a stamen), Gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) Fruit: Definition, forms- simple (dry, legume, fleshy, berry), aggregate (Etario of berries), composite (Sorosis).	12	
Unit IV March	**Study of Plant Families** Study of vegetative and floral characters of following families: rassicaceae, Fabaceae, Solanaceae, Lamiaceae and Poaceae .	12	

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TEACHING PLAN: 2019-20

Name of The Teacher –**Dr. Tawade S.V.** ----------

Class: B.Sc-I Sem-I

Paper No.: II Title : Plant Ecology ,Phytogeography and Environmental Biology

Unit No.	Topic/subtopic	Planning Expected Period	Executions Actual No. Period
Unit I June	**Ecological Factors** Introduction, Scope of Ecology, Ecological Factors: Climatic factors- Light, Temperature, Wind, Humidity. Edaphic factors- Soil moisture, Temperature, Soil pH, Soil formation, Composition and Soil profile.	*(10 periods)*	
Unit II July	**Ecological Adaptations** Morphological and anatomical adaptations in Hydrophytes (*Hydrilla* stem and *Nymphea* petiole), Xerophytes (*Nerium* leaf and *Casuarina* stem). General characters of Halophytes and Epiphytes.	11	
Unit III Aug.	**Ecosystem and Plant Communities** Ecosystem: Introduction, Structure, types (Pond ecosystem and Forest ecosystem), Tropic levels,Energy flow in ecosystem, food chain, food web and ecological pyramids. 13 Community ecology: Community characteristics, Frequency, Density, Life forms and ecological succession (Hydrosere), Analysis of Plant communities (quadrant method).	12	
Unit IV Sept.	**Phytogeography and Environmental Biology** Introduction, Bio-geographical regions of India, Bio-diversity hot spots of India Environmental pollution: Air, Water and soil pollution (Causes, effects and control measures), Soil erosion and soil conservation, afforestation , deforestation and Chipko movement, Environmental education and awareness.	12	

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DEPARTMENT OF BOTANY

Class: B.SC-F.Y

Academic Year-2020-2021

Title of the Paper & No.: Plant Ecology ,Phytogeography and Environmental Biology- II & Taxonomy of Angiosperms -IV

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2020-21

Month	Course content	Expected Periods
June	Admission	
July	**Unit I: Ecological Factors** Introduction, Scope of Ecology, Ecological Factors: Climatic factors- Light, Temperature, Wind, Humidity. Edaphic factors- Soil moisture, Temperature, Soil pH, Soil formation, Composition and Soil profile.	**10 Lectures**
	Study of morphology of Bacteria by Gram staining method	**1 Practical**
	Study of citrus canker disease, Study of symptoms of yellow vein mosaic of Bhendi	**1 Practical**
	Study of Algae : Systematic position and external features of *Nostoc, Oedogonium, Ectocarpus*	**1 Practical**
	Study of Fungi: systematic position, external and internal features of *Penicillium, Alternaria and Agaricus.*	**1 Practical**
Aug	**Unit II: Ecological Adaptations** Morphological and anatomical adaptations in Hydrophytes (*Hydrilla* stem and *Nymphea* petiole), Xerophytes (*Nerium* leaf and *Casuarina* stem). General characters of Halophytes and Epiphytes.	**11 Lectures**
	Study of different forms of Lichens	**1 Practical**
	Study of ectomycorrhiza and endomycorrhiza	**1 Practical**
	Study of *Marchantia*- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides).	**1 Practical**
	v.s. antheridiophore, archegoniophore, L. S. of sporophyte (all permanent slides)	**1 Practical**
Sept	**Unit III: Ecosystem and Plant Communities** Ecosystem: Introduction, Structure, types (Pond ecosystem and Forest ecosystem), Tropic levels, Energy flow in ecosystem, food chain, food web and ecological pyramids. Community ecology: Community characteristics, Frequency, Density, Life forms and ecological succession (Hydrosere), Analysis of Plant communities (quadrant method).	**12 Lectures**
	Study of *Funaria*- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides).	**1 Practical**
	permanent slides showing antheridial and archegonial heads, L.S.of capsule and protonema	**1 Practical**
	Lycopodium- morphological and anatomical study	**1 Practical**
Oct	**Unit IV: Phytogeography and Environmental Biology** Introduction, Bio-geographical regions of India, Bio-diversity hot spots of India Environmental pollution: Air, Water and soil pollution (Causes, effects and control measures), Soil erosion and soil conservation, afforestation , deforestation and Chipko movement, Environmental education and awareness.	**10 Lectures**

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	Marsilea- morphological and anatomical study of petiole and rhizome	**1 Practical**
Nov	**Examinations**	
Dec	**Unit I: Introduction** Aims of Taxonomy, Principles of Taxonomy, Identification, Nomenclature and Classification, Principles and rules of ICN (Rank of taxa, typification, and author citation) Importance of Herbarium, important herbaria and botanical gardens of the India.	**10 Lectures**
	Cycas- morphology ,T.S of. rachis, T.S.of leaflet, male and female cone	**1 Practical**
	Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female cone).	**1 Practical**
	Study of fossil Plants	**1 Practical**
	Estimation of soil Bulk density and porosity	**1 Practical**
Jan	**Unit II: Plant Classification** Taxonomic hierarchy,Types of classification-artificial, natural and phylogenetic. Bentham and Hooker, Engler and Prantl (up to family level with reference to families mentioned in the syllabus).	**11 Lectures**
	Study of morphological and anatomical adaptations of hydrophytes (*Hydrilla* stem and *Nymphea* petiole)	**1 Practical**
	xerophytes (*Nerium* leaf and *Casuarina* stem)	**1 Practical**
	Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus	**1 Practical**
	Brassicaceae	**1 Practical**
Feb	**Unit III: Morphology of Angiosperms** Root: Definition, characters, types (tap root and adventitious) and functions. Stem: Definition, characters and functions. Leaf: Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation-definition, types (reticulate, parallel), Phyllotaxy. Inflorescence: Definition, types- Racemose (characters), Cymose (characters). Flower: Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), Androecium (parts of a stamen), Gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) Fruit: Definition, forms- simple (dry, legume, fleshy, berry), aggregate (Etario of berries), composite (Sorosis).	**12 Lectures**
	Study of Family : Fabaceae.	**1 Practical**
	Study of Family : Solanaceae.	**1 Practical**
	Study of Family : Lamiaceae.	**1 Practical**
	Study of Family : Poaceae.	**1 Practical**
March	**Unit IV: Study of Plant Families** Study of vegetative and floral characters of following families: Brassicaceae, Fabaceae, Solanaceae, Lamiaceae and Poaceae .	**12 Lectures**
April	**Examinations**	

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DEPARTMENT OF BOTANY

Class: B.SC-S.Y

Academic Year-2020-2021

Title of the Paper & No.: **Plant Anatomy –VI, Plant Embryology –VIII & SECB-I (A) FRUIT AND VEGETABLE PROCESSING & SECB-II (B) BIO-FERTILIZERS**

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
June	**UNIT I: MERISTEMATIC TISSUE** Introduction and Scope of Plant Anatomy **Meristematic Tissues**: Definition, classification based on origin, function, position and development, organization of root apical meristem (RAM)	**06Periods**
	Study of Meristematic tissues Study of root apex with the help of Slides/ Models/Charts/ Photocopies	1 practical
	Study of Meristematic tissues (Study of shoot apex) with the help of Slides/ Models/Charts/ Photocopies	1 practical
July	Shoot apical meristem (SAM), apical cell theory, Histogen theory and Tunica corpus theory.	**04 Periods**
	Unit II : TISSUE SYSTEMS IN PLANTS **Simple Tissues**: Parenchyma, Collenchyma, Sclerenchyma. **Complex tissues**: Xylem and Phloem. **Secretory Structures in Plants**: Laticiferous tissues (Latex cells and vessels), glandular tissues (External glands-digestive glands, nectary glands & internal glands-Oil glands, hydathodes)	**08 Periods**
	Study of tissues, Parenchyma, Collenchyma, Sclerenchyma. (Permanent slides only)	1 practical
	Xylem And Phloem (Permanent slides only)	1 practical
	Maceration of tissues and the observation of sclereids- types, vessels- thickening	1 practical
	Study secretary tissues with the help of Slides/Models/Charts/ Photocopies	1 practical
	SEC	
Aug	**Adaptive & Protective systems in plants**: stomata, Epidermis, cutin, cuticle & other types of coverings, epidermal appendages.	**04 Periods**
	UNIT III: ANATOMY -I **Vascular Bundles**: Definition and types. **Primary structures**:Root anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower), Stem anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower),	**08 Periods**
	Study of Epidermal tissue system: stomata types; trichomes: non-glandular and glandular	1 practical
	Preparation of a double stained permanent slide of stem of *Maize,* for the study of internal structures	1 practical
	Preparation of a double stained permanent slide of stem of *Sunflower.*	1 practical
	Preparation of a double stained permanent slide of stem of *Achyranthus.*	1 practical
	Preparation of banana and potato wafers	1 practical
Sept.	Leaf anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower), Primary growth in roots and stems of plants.	**02 Periods**
	UNIT IV: ANATOMY -II **Secondary Growth**- Normal Secondary growth in root and stem of Dicotyledons (Sunflower), **Anomalous Secondary growth**:	**10 Periods**

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	Achyranthes stem, *Mirabilis*, *Bignonia* and *Dracaena* stem. **Wood Anatomy**- Annual rings , Wood Elements, heartwood and sapwood, Springwood, Summer wood, Tension Wood, Economic importance of wood and wood elements,	
	Preparation of a double stained permanent slide of stem of *Mirabilis.*	1 practical
	Preparation of a double stained permanent slide of stem of *Bignonia.*	1 practical
	Preparation of a double stained permanent slide of stem of *Dracaena*.	1 practical
	Study of wood specimens for Heart wood & Sap wood	1 practical
	Preparation of jam/ jelly from selected fruit	1 practical
Oct	Dendrochronology. **Periderm**: Development and composition of periderm, rhytidome and lenticels.	**02 Periods**
	Study of Leaf anatomy : Dicot and Monocot leaf (only Permanent slides)	1 practical
	Preparation of fruit candy	1 practical
Nov	**Examinations**	
Dec	**UNIT I: EMBRYOLOGY** Introduction- Definition and Scope, Contribution of embryologists: W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.G.L. Swamy and B.M. Johri Microsporangium- Structure of typical anther, T.S. of Anther, Microsporogenesis, Structure of Pollen grain, Development of male gametophyte, male sterility, Pollen germination, Pollen tube growth and guidance, Pollen storage, Pollen allergy, Pollen embryo. Brief account of Palynology	**13 Periods**
	Study of root anatomy: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary growth: *Helianthus* (only Permanent slides).	1 practical
	Study of T.S of anther with help of *Datura* flower	1 practical
	Mounting of pollen grains (available flowers only) *Ipomea, Vinca, Malvaceae* and Legume.	1 practical
	Study of Ovule/Types of ovules–Megasporogenesis and Female gametophyte (permanent slides/ Models)	1 practical
	Preparation of pickle	1 practical
Jan	**UNIT II: POLLINATION BIOLOGY** Pollination, introduction, definition, Agents of pollination, mechanism of pollination in Salvia plant Types of pollination, self-pollination, cross pollination, adaptations (contrivances) in pollination.	**10 Periods**
	Study of embryo and types of Endosperms (permanent slides/ Models/ Charts)	1 practical
	Study of Seed dispersal mechanisms (adaptations through photographs / specimens)	1 practical
	Field study of several types of flower with different pollination mechanisms.	1 practical
	Preparation of fruit leather	1 practical
	Isolation of Rhizobium from root nodules of leguminous crop	1 practical
Feb	**UNIT III: MEGASPORANGIUM AND FERTILIZATION –II** Megasporangium- Structure of typical ovule, L.S. Ovule, types of ovule (Orthotropous, Anatropous, Hemianatropous, Amphitropous, Camphylotropous and Circinotropous) Megasporogenesis, structure of the embryo sac, Development of Monosporic (*Polygonum* type), Bisporic (*Allium* type) and Tetrasporic (*Adoxa* type) female gametophytes, Fertilization- Double fertilization and triple fusion, Significance of fertilization	**11 Period**
	Isolation of *Azospirillum*	1 practical
	Isolation Blue Green Algae from soil	1 practical
March	**UNIT IV: EMBRYO AND ENDOSPERM** Endosperm- Definition and types of endosperms (Nuclear, Cellular	**11 Period**

	and Helobial endosperm),Embryo- Definition, Development of Dicot (Crucifer type) embryo and Monocot (Sagittaria type), Development of seed and Fruit (Post fertilization changes), Seed dispersal and Seed germination, Seed appendages, Endospermic and non-endospermic seeds. A brief account of Polyembryony, Apomixis and Parthenocarpy	
	Methods of application of biofertilizers	1 practical
April	**Examinations**	

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DEPARTMENT OF BOTANY

Class: B.SC-T.Y

Academic Year-2020-2021

Title of the Paper & No.: PLANT PATHOLOGY-I (B-I) XIII & PLANT PATHOLOGY-II (B-I) XV

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
June	**UNIT-I : FUNDAMENTALS OF PLANT PATHOLOGY:** Scope, importance, history and advancement of plant pathology, classification of plant diseases on the basis of causal organism and symptoms, field and laboratory diagnosis-	**06Periods**
July	Isolation of plant pathogens from infected plant parts, soil and air, Pure culture technique, Koch's postulates for pathogenicity. **UNIT-II : PLANT DISEASE DEVELOPMENT:** Disease development- Mode of entry of pathogens (through stomata, wounds, root hairs and buds), Factors affecting disease development- Temperature, moisture, wind and soil pH, Dispersal of plant pathogens (by air, water, insects and animals).	**04 Periods** **08 Periods**
	Study of laboratory equipment's- Autoclave, Hot air oven, inoculating chamber, laminar air flow, Air sampler, Incubator, Centrifuge	1 practical
	Preparation of culture media – PDA, NA Micrometry	1 practical
	Calibration of microscope and measurement of fungal spores	1 practical
Aug	Chemical weapons of pathogen: enzymes, toxins and growth regulators. **UNIT-III : PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Green ear of Bajra, leaf spot of tomato, Grain smut of Jowar, Red rot of Sugarcane, Angular leaf spot of cotton, , Bacterial blight of Pomegranate.	**02 Periods** **10 Periods**
	Isolation of fungal pathogens from diseased plant parts, Toxins & Enzymes	1 practical
	Isolation and identification of seed-borne pathogen by blotter / agar plate method	1 Practical
	Study of air – borne pathogen by exposed petri plates / air sampler	2 Practical
Sept.	Anthracnose of mango.	**02 Periods**
	UNIT-IV : PLANT DISEASES-II Symptoms, causal organisms, disease cycle and control measures of White rust of Mustard,Whip smut of Sugarcane, Powdery mildew of pea, Leaf spot of Turmeric (*Colletotrichum capsci*), Citrus canker,	**09 Periods**

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	Study of symptoms and causal organisms of Stem rust of wheat	1 Practical
	Study of symptoms and causal organisms of Tikka disease of groundnut & Anthracnose of guava	1 Practical
	study of symptoms and causal organisms of Early Blight of tomato and leaf spot of turmeric	1 Practical
	Study of symptoms and causal organisms of Rust of Jowar and Grain smut of Jowar	1 Practical
Oct	Sigatoka disease of Banana, leaf blight of Rice.	**03 Periods**
Nov	**Examinations**	
Dec	**UNIT-I : AEROBIOLOGY AND SEED PATHOLOGY** Aerobiology- Definition, scope and importance and disease forecasting, Seed pathology- Definition, seed borne pathogens (external and internal) detection of seed borne pathogens by Blotter paper and agar plate methods, seed treatment (hot water, solar, chemical) and seed certification.	**11 Periods**
	Study of symptoms and causal organisms of Loose smut of Wheat	1 Practical
	Study of symptoms and causal organisms of Green ear and ergot of Bajra	1 Practical
	Study of symptoms and causal organisms of wilt of Tur and Whip smut of sugarcane	1 Practical
	Study of symptoms and causal organisms of white rust of Mustard / leaf spot of cabbage	1 Practical
Jan	**UNIT-II : DEFENSE MECHANISM AND PLANT DISEASE MANAGEMENT** Structural (pre-existing and Post infectional) and biochemical defense-pre-existing and Post infectional (phytoalexins) Exclusion and eradication, Chemical control- General account of Sulphur, Copper, systemic fungicides and antibiotics, Biological control.	**11 Periods**
	Study of symptomology: citrus canker, Root knot of tomato, Angular leaf spot of cotton,	1 Practical
	papaya mosaic , Rust of soybean , sigatoka disease of Banana	1 Practical
	Anthracnose of mango , phanerogamic disease due to cuscuta	1 Practical
	Field Visit	1 Practical
Feb	**UNIT-III : PLANT DISEASES-I** Symptoms, causal organisms, disease cycle and control measures of Tikka disease of groundnut, Ergot of Bajra, Loose smut of Wheat, Rust of Jowar, Phanerogamic parasites(Cuscuta), Leaf curl of tomato.	**11 Period**
March	**UNIT-IV : PLANT DISEASES-II** Symptoms, causal organisms, disease cycle and control measures of Downy mildew of Grape, Stem rust of Wheat, Wilt of Tur, late blight of Potato, Grassy shoot of Sugarcane, Papaya mosaic, Rust of Soybean, Leaf spot of cabbage.	**12 Period**
April	**Examinations**	

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Annual Teaching Plan for 2021 - 2022

Work Distribution

Class	Teachers			
	Dr. S. V. Tawade		Dr. N. A. Dhole	
	Theory	Practicals	Theory	Practicals
B.Sc. I Sem I	Paper II	Paper V	Paper I	Paper V
B.Sc. I Sem II	Paper IV		Paper III	
B.Sc. II Sem III	Paper VI	PAPER – X	Paper VII	paper XI
B.Sc. II Sem IV	Paper VIII		Paper IX	
B.Sc. III Sem V	Paper XIII-A	PAPER- XVII	Paper -XII	PAPER-XVI
B.Sc. III Sem VI	Paper-XV-A		Paper XIII	

SEC -I & II

SEC III & IV

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DEPARTMENT OF BOTANY

Class: B.SC-F.Y

Academic Year-2021-2022

Title of the Paper & No.: Plant Ecology ,Phytogeography and Environmental Biology- II & Taxonomy of Angiosperms -IV

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2021-22

Month	Course content	Expected Periods
June	Admission	
July	**Unit I: Ecological Factors** Introduction, Scope of Ecology, Ecological Factors: Climatic factors- Light, Temperature, Wind, Humidity. Edaphic factors- Soil moisture, Temperature, Soil pH, Soil formation, Composition and Soil profile.	**10 Lectures**
	Study of morphology of Bacteria by Gram staining method	**1 Practical**
	Study of citrus canker disease, Study of symptoms of yellow vein mosaic of Bhendi	**1 Practical**
	Study of Algae : Systematic position and external features of *Nostoc, Oedogonium, Ectocarpus*	**1 Practical**
	Study of Fungi: systematic position, external and internal features of *Penicillium, Alternaria and Agaricus.*	**1 Practical**
Aug	**Unit II: Ecological Adaptations** Morphological and anatomical adaptations in Hydrophytes (*Hydrilla* stem and *Nymphea* petiole), Xerophytes (*Nerium* leaf and *Casuarina* stem). General characters of Halophytes and Epiphytes.	**11 Lectures**
	Study of different forms of Lichens	**1 Practical**
	Study of ectomycorrhiza and endomycorrhiza	**1 Practical**
	Study of *Marchantia*- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides).	**1 Practical**
	v.s. antheridiophore, archegoniophore, L. S. of sporophyte (all permanent slides)	**1 Practical**
Sept	**Unit III: Ecosystem and Plant Communities** Ecosystem: Introduction, Structure, types (Pond ecosystem and Forest ecosystem), Tropic levels, Energy flow in ecosystem, food chain, food web and ecological pyramids. Community ecology: Community characteristics, Frequency, Density, Life forms and ecological succession (Hydrosere), Analysis of Plant communities (quadrant method).	**12 Lectures**
	Study of *Funaria*- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides).	**1 Practical**
	permanent slides showing antheridial and archegonial heads, L.S.of capsule and protonema	**1 Practical**
	Lycopodium- morphological and anatomical study	**1 Practical**
Oct	**Unit IV: Phytogeography and Environmental Biology** Introduction, Bio-geographical regions of India, Bio-diversity hot spots of India Environmental pollution: Air, Water and soil pollution (Causes, effects and control measures), Soil erosion and soil conservation, afforestation , deforestation and Chipko movement, Environmental education and awareness.	**10 Lectures**

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	Marsilea- morphological and anatomical study of petiole and rhizome	**1 Practical**
Nov	**Examinations**	
Dec	**Unit I: Introduction** Aims of Taxonomy, Principles of Taxonomy, Identification, Nomenclature and Classification, Principles and rules of ICN (Rank of taxa, typification, and author citation) Importance of Herbarium, important herbaria and botanical gardens of the India.	**10 Lectures**
	Cycas- morphology ,T.S of. rachis, T.S.of leaflet, male and female cone	**1 Practical**
	Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female cone).	**1 Practical**
	Study of fossil Plants	**1 Practical**
	Estimation of soil Bulk density and porosity	**1 Practical**
Jan	**Unit II: Plant Classification** Taxonomic hierarchy.Types of classification-artificial, natural and phylogenetic. Bentham and Hooker, Engler and Prantl (up to family level with reference to families mentioned in the syllabus).	**11 Lectures**
	Study of morphological and anatomical adaptations of hydrophytes (*Hydrilla* stem and *Nymphea* petiole)	**1 Practical**
	xerophytes (*Nerium* leaf and *Casuarina* stem)	**1 Practical**
	Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus	**1 Practical**
	Brassicaceae	**1 Practical**
Feb	**Unit III: Morphology of Angiosperms** Root: Definition, characters, types (tap root and adventitious) and functions. Stem: Definition, characters and functions. Leaf: Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation-definition, types (reticulate, parallel), Phyllotaxy. Inflorescence: Definition, types- Racemose (characters), Cymose (characters). Flower: Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), Androecium (parts of a stamen), Gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) Fruit: Definition, forms- simple (dry, legume, fleshy, berry), aggregate (Etario of berries), composite (Sorosis).	**12 Lectures**
	Study of Family : Fabaceae.	**1 Practical**
	Study of Family : Solanaceae.	**1 Practical**
	Study of Family : Lamiaceae.	**1 Practical**
	Study of Family : Poaceae.	**1 Practical**
March	**Unit IV: Study of Plant Families** Study of vegetative and floral characters of following families: Brassicaceae, Fabaceae, Solanaceae, Lamiaceae and Poaceae .	**12 Lectures**
April	**Examinations**	

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DEPARTMENT OF BOTANY

Class: B.SC-S.Y

Academic Year-2021-2022

Title of the Paper & No.: **Plant Anatomy –VI, Plant Embryology –VIII &**
SECB-I (A) FRUIT AND VEGETABLE PROCESSING & SECB-II (B) BIO-FERTILIZERS

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
June	**UNIT I: MERISTEMATIC TISSUE** Introduction and Scope of Plant Anatomy **Meristematic Tissues**: Definition, classification based on origin, function, position and development, organization of root apical meristem (RAM)	**06Periods**
	Study of Meristematic tissues Study of root apex with the help of Slides/ Models/Charts/ Photocopies	1 practical
	Study of Meristematic tissues (Study of shoot apex) with the help of Slides/ Models/Charts/ Photocopies	1 practical
July	Shoot apical meristem (SAM), apical cell theory, Histogen theory and Tunica corpus theory.	**04 Periods**
	Unit II : TISSUE SYSTEMS IN PLANTS **Simple Tissues**: Parenchyma, Collenchyma, Sclerenchyma. **Complex tissues**: Xylem and Phloem. **Secretory Structures in Plants**: Laticiferous tissues (Latex cells and vessels), glandular tissues (External glands-digestive glands, nectary glands & internal glands-Oil glands, hydathodes)	**08 Periods**
	Study of tissues, Parenchyma, Collenchyma, Sclerenchyma. (Permanent slides only)	1 practical
	Xylem And Phloem (Permanent slides only)	1 practical
	Maceration of tissues and the observation of sclereids- types, vessels- thickening	1 practical
	Study secretary tissues with the help of Slides/Models/Charts/ Photocopies	1 practical
	SEC	
Aug	**Adaptive & Protective systems in plants**: stomata, Epidermis, cutin, cuticle & other types of coverings, epidermal appendages.	**04 Periods**
	UNIT III: ANATOMY -I Vascular Bundles: Definition and types. **Primary structures**:Root anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower), Stem anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower),	**08 Periods**
	Study of Epidermal tissue system: stomata types; trichomes: non-glandular and glandular	1 practical
	Preparation of a double stained permanent slide of stem of *Maize,* for the study of internal structures	1 practical
	Preparation of a double stained permanent slide of stem of *Sunflower.*	1 practical
	Preparation of a double stained permanent slide of stem of *Achyranthus.*	1 practical
	Preparation of banana and potato wafers	1 practical
Sept.	Leaf anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower), Primary growth in roots and stems of plants.	**02 Periods**
	UNIT IV: ANATOMY -II	**10 Periods**

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	Secondary Growth- Normal Secondary growth in root and stem of Dicotyledons (Sunflower), **Anomalous Secondary growth**: *Achyranthes* stem, *Mirabilis*, *Bignonia* and *Dracaena* stem. **Wood Anatomy**- Annual rings , Wood Elements, heartwood and sapwood, Springwood, Summer wood, Tension Wood, Economic importance of wood and wood elements,	
	Preparation of a double stained permanent slide of stem of *Mirabilis*.	1 practical
	Preparation of a double stained permanent slide of stem of *Bignonia*.	1 practical
	Preparation of a double stained permanent slide of stem of *Dracaena*.	1 practical
	Study of wood specimens for Heart wood & Sap wood	1 practical
	Preparation of jam/ jelly from selected fruit	1 practical
Oct.	Dendrochronology. **Periderm**: Development and composition of periderm, rhytidome and lenticels.	**02 Periods**
	Study of Leaf anatomy : Dicot and Monocot leaf (only Permanent slides)	1 practical
	Preparation of fruit candy	1 practical
Nov	**Examinations**	
Dec	**UNIT I: EMBRYOLOGY** Introduction- Definition and Scope, Contribution of embryologists: W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.G.L. Swamy and B.M. Johri Microsporangium- Structure of typical anther, T.S. of Anther, Microsporogenesis, Structure of Pollen grain, Development of male gametophyte, male sterility, Pollen germination, Pollen tube growth and guidance, Pollen storage, Pollen allergy, Pollen embryo. Brief account of Palynology	**13 Periods**
	Study of root anatomy: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary growth: *Helianthus* (only Permanent slides).	1 practical
	Study of T.S of anther with help of *Datura* flower	1 practical
	Mounting of pollen grains (available flowers only) *Ipomea, Vinca, Malvaceae* and Legume.	1 practical
	Study of Ovule/Types of ovules–Megasporogenesis and Female gametophyte (permanent slides/ Models)	1 practical
	Preparation of pickle	1 practical
Jan	**UNIT II: POLLINATION BIOLOGY** Pollination, introduction, definition, Agents of pollination, mechanism of pollination in Salvia plant Types of pollination, self-pollination, cross pollination, adaptations (contrivances) in pollination.	**10 Periods**
	Study of embryo and types of Endosperms (permanent slides/ Models/ Charts)	1 practical
	Study of Seed dispersal mechanisms (adaptations through photographs / specimens)	1 practical
	Field study of several types of flower with different pollination mechanisms.	1 practical
	Preparation of fruit leather	1 practical
	Isolation of Rhizobium from root nodules of leguminous crop	1 practical
Feb	**UNIT III: MEGASPORANGIUM AND FERTILIZATION –II** Megasporangium- Structure of typical ovule, L.S. Ovule, types of ovule (Orthotropous, Anatropous, Hemianatropous, Amphitropous, Camphylotropous and Circinotropous) Megasporogenesis, structure of the embryo sac, Development of Monosporic (*Polygonum* type), Bisporic (*Allium* type) and Tetrasporic (*Adoxa* type) female gametophytes, Fertilization- Double fertilization and triple fusion, Significance of fertilization	**11 Period**
	Isolation of *Azospirillum*	1 practical

	Isolation Blue Green Algae from soil	1 practical
March	**UNIT IV: EMBRYO AND ENDOSPERM** Endosperm- Definition and types of endosperms (Nuclear, Cellular and Helobial endosperm),Embryo- Definition, Development of Dicot (Crucifer type) embryo and Monocot (Sagittaria type), Development of seed and Fruit (Post fertilization changes), Seed dispersal and Seed germination, Seed appendages, Endospermic and non-endospermic seeds. A brief account of Polyembryony, Apomixis and Parthenocarpy	**11 Period**
	Methods of application of biofertilizers	1 practical
April	**Examinations**	

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DEPARTMENT OF BOTANY

Class: B.SC-T.Y

Academic Year-2021-2022

Title of the Paper & No.: PLANT PATHOLOGY-I (B-I) XIII & PLANT PATHOLOGY-II (B-I) XV

Name of the Teacher: Dr. S.V. Tawade

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
June	**UNIT-I : FUNDAMENTALS OF PLANT PATHOLOGY:** Scope, importance, history and advancement of plant pathology, classification of plant diseases on the basis of causal organism and symptoms, field and laboratory diagnosis-	**06Periods**
July	Isolation of plant pathogens from infected plant parts, soil and air, Pure culture technique, Koch's postulates for pathogenicity. **UNIT-II : PLANT DISEASE DEVELOPMENT:** Disease development- Mode of entry of pathogens (through stomata, wounds, root hairs and buds), Factors affecting disease development- Temperature, moisture, wind and soil pH, Dispersal of plant pathogens (by air, water, insects and animals).	**04 Periods** **08 Periods**
	Study of laboratory equipment's- Autoclave, Hot air oven, inoculating chamber, laminar air flow, Air sampler, Incubator, Centrifuge	1 practical
	Preparation of culture media – PDA, NA Micrometry	1 practical
	Calibration of microscope and measurement of fungal spores	1 practical
Aug	Chemical weapons of pathogen: enzymes, toxins and growth regulators. **UNIT-III : PLANT DISEASES-I:** Symptoms, causal organisms, disease cycle and control measures of Green ear of Bajra, leaf spot of tomato, Grain smut of Jowar, Red rot of Sugarcane, Angular leaf spot of cotton, , Bacterial blight of Pomegranate.	**02 Periods** **10 Periods**
	Isolation of fungal pathogens from diseased plant parts, Toxins & Enzymes	1 practical
	Isolation and identification of seed-borne pathogen by blotter / agar plate method	1 Practical
	Study of air – borne pathogen by exposed petri plates / air sampler	2 Practical
Sept.	Anthracnose of mango.	**02 Periods**
	UNIT-IV : PLANT DISEASES-II Symptoms, causal organisms, disease cycle and control measures of White rust of Mustard, Whip smut of Sugarcane,	**09 Periods**

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	Powdery mildew of pea, Leaf spot of Turmeric (*Colletotrichum capsci*), Citrus canker,	
	Study of symptoms and causal organisms of Stem rust of wheat	1 Practical
	Study of symptoms and causal organisms of Tikka disease of groundnut & Anthracnose of guava	1 Practical
	study of symptoms and causal organisms of Early Blight of tomato and leaf spot of turmeric	1 Practical
	Study of symptoms and causal organisms of Rust of Jowar and Grain smut of Jowar	1 Practical
Oct	Sigatoka disease of Banana, leaf blight of Rice.	**03 Periods**
Nov	**Examinations**	
Dec	**UNIT-I : AEROBIOLOGY AND SEED PATHOLOGY** Aerobiology- Definition, scope and importance and disease forecasting, Seed pathology- Definition, seed borne pathogens (external and internal) detection of seed borne pathogens by Blotter paper and agar plate methods, seed treatment (hot water, solar, chemical) and seed certification.	**11 Periods**
	Study of symptoms and causal organisms of Loose smut of Wheat	1 Practical
	Study of symptoms and causal organisms of Green ear and ergot of Bajra	1 Practical
	Study of symptoms and causal organisms of wilt of Tur and Whip smut of sugarcane	1 Practical
	Study of symptoms and causal organisms of white rust of Mustard / leaf spot of cabbage	1 Practical
Jan	**UNIT-II : DEFENSE MECHANISM AND PLANT DISEASE MANAGEMENT** Structural (pre-existing and Post infectional) and biochemical defense-pre-existing and Post infectional (phytoalexins) Exclusion and eradication, Chemical control- General account of Sulphur, Copper, systemic fungicides and antibiotics, Biological control.	**11 Periods**
	Study of symptomology: citrus canker, Root knot of tomato, Angular leaf spot of cotton,	1 Practical
	papaya mosaic , Rust of soybean , sigatoka disease of Banana	1 Practical
	Anthracnose of mango , phanerogamic disease due to cuscuta	1 Practical
	Field Visit	1 Practical
Feb	**UNIT-III : PLANT DISEASES-I** Symptoms, causal organisms, disease cycle and control measures of Tikka disease of groundnut, Ergot of Bajra, Loose smut of Wheat, Rust of Jowar, Phanerogamic parasites(Cuscuta), Leaf curl of tomato.	**11 Period**
March	**UNIT-IV : PLANT DISEASES-II** Symptoms, causal organisms, disease cycle and control measures of Downy mildew of Grape, Stem rust of Wheat, Wilt of Tur, late blight of Potato, Grassy shoot of Sugarcane, Papaya mosaic, Rust of Soybean, Leaf spot of cabbage.	**12 Period**
April	**Examinations**	

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