Lesson Plan

Class: B.Sc. (Med.) 1st Semester

Subject: Botany Major (Theory)

Dr. Savita Kadian : From July 2024 to December 2024

Time period	Topics
July(LastWeek)	Bacteria- General characters
August (Week 1)	Bacteria- Nutrition, Reproduction, Economic importance
Week 2	Types-archaebacteria,eubacteria,wall-lessforms(mycoplasma and spheroplasts)
Week 3	General characters of Algae- Classification, Economic importance .Important features and life-history (excluding development) of *Volvox*, *Oedogonium* (Chlorophyceae),
Week 4	*Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae) **TEST**
September (Week 1)	**Viruses:** General account of Viruses including structure of TMV and T-phage viroids and prions, replication (general account)
Week 2	Lytic and lysogenic cycle, RNA virus (TMV). **Fungi:** General characters, classification (upto classes) and economic importance
Week 3	Important features and life-history of *Phytophthora* (Mastigomycotina), *Mucor*(Zygomycotina), *Penicillium* (Ascomycotina), *Puccinia*
Week 4	*Agaricus* (Basidiomycotina), *Colletotrichum* (Deuteromycotina)

October(Week 1)	Classification, morphology, internal structure, reproduction and economic importance of Lichens
Week 2	Ectomycorrhiza and endomycorrhiza and their significance
Week 3	General characters; thallus organization; cell structure; heterocyst and akinete development
Week 4	reproduction of Cyanobacteria
November(Week 1)	Life-cycle of *Nostoc* and *Oscillatoria*
Week 2	Economic Importance of Cyanobacteria.
Week 3	**Revision and Test**
Week 4	**Revision and Test**

Class: B.Sc. (Med.) 1st Semester

Subject: Botany Skill (Theory)

Dr. Savita Kadian : From July 2024 to December 2024

Time period	Topics
July(LastWeek)	Biofertilizers: Definition, scope,status, and importance
August (Week 1)	Advantages and limitations of biofertilizers compared to chemical fertilizers.
Week 2	Types of biofertilizers 1. nitrogen-fixing 2. phosphate-solubilizing, 3. plant growth-promoting
Week 3	Structure and characteristic features of bacterial (*Azospirillum*, *Azotobacter*, *Rhizobium*), actinomycetes (*Frankia*), cyanobacterial (*Anabaena* and *Nostoc*) and fungal (Arbuscular Mycorrhizal Fungi and Ectomycorrhiza) biofertilizers.
Week 4	Production of biofertilizers: Strain selection, sterilization, growth, equipment, fermentation (solid state and submerged), mass production of carrier based and liquid biofertilizers.
September (Week 1)	Factors affecting the production of biofertilizers (i.e., temperature, pH, aeration, carbon source); quality control of biofertilizers
Week 2	Application methods and dosage of biofertilizers.
Week 3	Effect of biofertilizerson soil fertility, plant growth, and yield.
Week 4	Revision and test.
October (Week 1)	Biofertilizers -storage,shelf life, quality control and marketing; regulatory framework and certification of biofertilizers.
Week 2	Application technology for seeds, seedlings, tubers, sets; factors influencing the efficacy of biofertilizers.
Week 3	Future prospects and potential of biofertilizers in sustainable agriculture and environmental protection.

Week 4	Biopesticides: Definition and classification; advantages and limitations of biopesticides compared to chemical pesticides.
November(Week 1)	Characteristics and applications of microbial pesticides– bacteria, fungi and viruses.
Week 2	Characteristics andapplications of botanicalpesticides (plant extracts andessential oils) and biochemical (pheromones and repellents) in disease control.
Week 3	Biocontrol agents(*Trichoderma*spp., *Pseudomonas*spp. and *Bacillus*spp) and their efficacy on seed borneand soil borneplant pathogens.
Week 4	Revision and test.

Lesson Plan

Class: B.Sc. (Med.) 1st Semester

Subject: Botany Skill (Practical)

Dr. Savita Kadian : From July 2024 to December 2024

Time period	Topics
July(LastWeek)	Nutritional media introduction
August (Week 1)	Nutritional media preparation
Week 2	Enumeration of microbial population in soi l bacteria, BGA
Week 3	Enumeration of microbial population in soil fungi, actinomycetes.
Week 4	Methods of isolation and purification of microbial cultures
September (Week 1)	Isolation of *Rhizobium* from legume root nodule.
Week 2	Isolation of BGA from rhizosphere.
Week 3	Revision and test.
Week 4	Isolation of mycorrhiza.
October(Week 1)	Culture of *Trichoderma* spp
Week 2	Culture of *Pseudomonas* spp
Week 3	Culture of *Bacillus* spp.
Week 4	Quality control tests for biofertilizers
November(Week 1)	Quality control tests for biopesticides
Week 2	Quality control tests for bioagents.
Week 3	Revision
Week 4	Test

Lesson Plan
Department of Botany (Minor Theory)
Ist Semester
Dr. Nidhi Verma from July 2024 to Dec 2024

Time period	Topics
July (Last week)	Introduction to ecology
August (Week 1)	Definition, scope and importance of ecology
Week 2	Levels of organization
Week 3	Environment introduction
Week 4	Environment factors climatic (water, humidity)
September (Week 1)	Environment factors climatic (wind, light, temperature)
Week 2	Edaphic (Soil profile, physiochemical properties)
Week 3	Topographic and biotic factors (species interaction topographic and biotic factors (species interaction)
Week 4	Morphological and anatomical features of hydrophytes
October (Week 1)	Morphological and anatomical features xerophytes and halophytes
Week 2	Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecad
Week 3	Ecosystem: Structure and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow)
	Assignment: Food chain, Food web and EcologicalPyramids
Week 4	Community ecology: Concepts; characteristics (qualitative and quantitative-analytical and synthetic); methods of analysis; ecological succession
November (Week 1) **Week 2**	. Biogeochemical cycles: Carbon, nitrogen, phosphorus andhydrological cycle. **Assignment**: **Biogeochemical cycles**
Week 3 **Week 4**	Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution:Sources, types and control of air and water pollution. **Assignment: Different Geographical regions of IndiaTest:** Global change: Greenhouse effect and greenhouse gases; impacts of global-warming; carbon trading; Ozone layer depletion; Bio-magnification. **Assignment: Project report on Pollution**

Lesson Plan
Department of Botany (Practical)
Minor
Dr. Nidhi Verma From July 2024 to Dec 2024

Time period	**Topics**
July (Week 4)	Determination of pH of soil and water samples.
August (Week 1)	Study of physical properties of soil- soil density and
Week 2	Study of physical properties of. water holding capacity, bulk density
Week 3	Study of physical properties of electrical conductivity of different types of soils.
Week 4	Studies of community structure by quadrate / line transact method
September (Week 1)	Hydrophytes
Week 2	Xerophytes
Week 3	halophytes and parasites in relation to their habitats
Week 4	To prepare a report on air, water and soil Pollution (any one) in your locality
October (Week 1)	Analysis for carbonates, chlorides, nitrates, sulphates.
Week 2	Analysis for organic matter and base deficiency of soil samples by field testing kits
Week 3	Analysis for organic matter and base deficiency of soil samples by field testing kits
Week 4	Determination of soil organic matter rapid titration method
November (Week1, Week 2)	Determination of dissolved oxygen of water samples from polluted and unpolluted sources
Week 3, Week 4	Field visit to familiarize students with different biomes, ecosystems and vegetation

Class: B.Sc. (Med.) 3rd Semester Subject: Botany (Theory)

Name of teacher : Dr. Nidhi Verma

From July 2024 to Dec 2024

Time period	Topics
July (Last week)	Diversity in Plant forms.
August (Week 1)	Plant tissues. **Test**
Week 2 **Week 3**	Introduction to Gymnosperms Classification of Gymnosperms Fossils and Fossilization & Geological Time-scale
Week 4	Fossil Gymnosperms Study of *Cycas*
September (Week 1)	*Cycas*
Week 2	*Pinus* **Test**
Week 3	*Ephedra*
Week 4	General characters of Angiosperms Shoot-Apical Meristem
October (Week 1)	Cambium
Week 2	Secondary growth in stem
Week 3	Wood **Test**
Week 4	Anomalous secondary growth in Stem
November (Week 1)	Leaf – Types& Phyllot0axy
Week 2	Leaf Anatomy
	Stomata
Week 3	Root- Apical Meristem
Week 4	Structural modifications in Roots

Class: B.Sc. (Med.) 3rd Semester Subject: Botany (Practical)

Name of teacher : Dr. Nidhi Verma

Practical lesson plan: From July 2024 to Dec 2024

Time period	Topics
July (Last week)	Preparation of permanent slides
August (Week 1)	Permanent slides and material of monocot stem
Week 2 **Week 3**	Permanent slides and material of dicot stem.
Week 4	Permanent slides and material of*Cycas*
September (Week 1)	Permanent slides and material of *Cycas*
Week 2	Permanent slides and material of *Pinus*
Week 3	Permanent slides and material of *Pinus*
Week 4	Leafmodifications
October (Week 1)	Monocot & Dicot Leaf
Week 2	Permanent slides and material of *Ephedra*
Week 3	Monocot & Dicot Root
Week 4	Root modifications
November (Week 1)	Root modifications
Week 2	Stem modifications
Week 3 **Week 4**	Leaf collection
	Stem modifications

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Lesson Plan

Dept. Of Botany

Class: B.Sc. (Med.) 5th Semester Subject: Botany (Theory)

Name of teacher : Dr. Veena Sachdeva, Dr. Renu Budhwar

From From Aug 2022 to Dec 2022

Time period	Topics
22 Aug to 27 Aug.	Water & its properties, Absorption of water by plants
29 Aug.to 3 Sep.	Transport of water in plants
5Sep. to 10 Sep.	Ecology
12Sep. to 17 Sep.	Abiotic factors, Biotic factors
19Sep. to 24 Sep.	Mineral nutrients&Mineral uptake
26Sep. to 1 oct.	Stomata
3 Oct. to 8 Oct.	Transpiration
10 Oct. to 19 Oct.	Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation; Photosynthesis : significance; historical aspects; **Assignment: Significance of Sustainable Development** **Test: UNIT-1(Physiology)**
27 Oct. to 5 Nov.	Photosynthetic pigments; action spectraand enhancement effects; concept of two photosystems. Adaptations of plants to water stress and salinity **Assignment: Plant Pigments**
7 Nov. to 12 Nov.	Z-scheme; photophosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration. Population ecology **Assignment: Photorespiration**
4 Nov. to 19 Nov.	Growth and development: Definitions; phases of growth and development; seed-dormancy; plant movements. Community ecology **Assignment: Collection of Xerophytes** **Test: Unit-1(Ecology)**
21 Nov. to 26 Nov.	The concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening. Ecosystem: Structure and functions **Assignment: Food chain, Food web and Ecological**

	Pyramids
28 Nov. to 3 Dec.	Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history oftheir discovery, mechanism of action. **Assignment: Plant hormones**
5 Dec. to 10 Dec.	Photo-morphogenesis; Phytochromes and their discovery, physiological role and mechanism of action. Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle. **Assignment**:**Biogeochemical cycles**
12 Dec. to 17 Dec.	Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution: Sources, types and control of air and waterpollution. **Assignment: Different Geographical regions of India** **Test: Unit-2(Physiology and Ecology)** Global change: Greenhouse effect and greenhouse gases; impacts of global-warming; carbon trading; Ozone layer depletion; Bio-magnification. **Assignment: Project report on Pollution**

Class: B.Sc. (Med.) 5th Semester Subject: Botany (Practical)

Name of teacher : Dr. Veena Sachdeva, Dr. Renu Budhwar

From Aug 2022 to Dec 2022

Time period	Topics
22 Aug to 27 Aug.	Plant Physiology
29 Aug.to 3 Sep.	Hydrophytes
5Sep. to 10 Sep.	Plant Physiology
12Sep. to 17 Sep.	Hydrophytes
19Sep. to 24 Sep.	Plant Physiology
26Sep. to 1 oct.	Plant Physiology
3 Oct. to 8 Oct.	Xerophytes
10 Oct. to 19 Oct.	Xerophytes
27 Oct. to 5 Nov.	Ecology
7 Nov. to 12 Nov.	Ecology
4 Nov. to 19 Nov.	Plant Physiology
21 Nov. to 26 Nov.	Ecology
28 Nov. to 3 Dec.	Plant Physiology
5 Dec. to 10 Dec.	Ecology

12 Dec. to 17 Dec.	Ecology

Class: B.Sc. (Med.) 3rd Semester Subject: Botany (Theory)

Name of teacher : Dr. Nidhi Verma

From Aug 2022 to Dec 2022

Time period	Topics
22 Aug to 27 Aug.	Diversity in Plant forms.
29 Aug.to 3 Sep.	Plant tissues. **Test**
5Sep. to 10 Sep.	Introduction to Gymnosperms Classification of Gymnosperms Fossils and Fossilization & Geological Time-scale
12Sep. to 17 Sep.	Fossil Gymnosperms Study of *Cycas*
19Sep. to 24 Sep.	*Cycas*
26Sep. to 1 oct.	*Pinus* **Test**
3 Oct. to 8 Oct.	*Ephedra*
10 Oct. to 19 Oct.	General characters of Angiosperms Shoot-Apical Meristem
27 Oct. to 5 Nov.	Cambium
7 Nov. to 12 Nov.	Secondary growth in stem
4 Nov. to 19 Nov.	Wood **Test**
21 Nov. to 26 Nov.	Anomalous secondary growth in Stem
28 Nov. to 3 Dec.	Leaf – Types& Phyllot0axy
5 Dec. to 10 Dec.	Leaf Anatomy
	Stomata

12 Dec. to 17 Dec.	Root- Apical Meristem
	Structural modifications in Roots

Class: B.Sc. (Med.) 3rd Semester Subject: Botany (Practical)

Name of teacher : Dr. Nidhi Verma

Practical lesson plan: From Aug 2022 to Dec 2022

Time period	**Topics**
22 Aug to 27 Aug.	Preparation of permanent slides
29 Aug.to 3 Sep.	Permanent slides and material of monocot stem
5Sep. to 10 Sep.	Permanent slides and material of dicot stem.
12Sep. to 17 Sep.	Permanent slides and material of*Cycas*
19Sep. to 24 Sep.	Permanent slides and material of *Cycas*
26Sep. to 1 oct.	Permanent slides and material of *Pinus*
3 Oct. to 8 Oct.	Permanent slides and material of *Pinus*
10 Oct. to 19 Oct.	Leafmodifications
27 Oct. to 5 Nov.	Monocot & Dicot Leaf
7 Nov. to 12 Nov.	Permanent slides and material of *Ephedra*
4 Nov. to 19 Nov.	Monocot & Dicot Root
21 Nov. to 26 Nov.	Root modifications
28 Nov. to 3 Dec.	Root modifications
5 Dec. to 10 Dec.	Stem modifications
12 Dec. to 17 Dec.	Leaf collection
	Stem modifications

Class: B.Sc. (Med.)1st Semester Subject: Botany (Theory)

Name of teacher : Dr. Savita Kadian, Ms. Mousam

From Aug 2022 to Dec 2022

Time period	Topics
22 Aug to 27 Aug.	Bacteria- General characters,
29 Aug.to 3 Sep.	Bacteria- Nutrition, Reproduction, Economic importance
5Sep. to 10 Sep.	General characters of Algae- Classification, Economic importance
12Sep. to 17 Sep.	Important features and life-history (excluding development) of *Volvox*, *Oedogonium* (Chlorophyceae),
19Sep. to 24 Sep.	*Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae)
26Sep. to 1 oct.	**Viruses:** General account of Viruses including structure of TMV and Bacteriophages
3 Oct. to 8 Oct.	**Fungi:** General characters, classification (upto classes) and economic importance; General account of Lichens
10 Oct. to 19 Oct.	**Cell Division**: Mitosis and Meiosis - Stages and Significance
27 Oct. to 5 Nov.	**Chromosomal aberrations**: Structural and Numerical - deletions, duplications, translocations, inversions, aneuploidy, polyploidy

7 Nov. to 12 Nov.	Test.
4 Nov. to 19 Nov.	Important features and life-history of *Phytophthora* (Mastigomycotina), *Mucor*
21 Nov. to 26 Nov.	Important features and life-history of *Phytophthora* (Mastigomycotina), *Mucor*
28 Nov. to 3 Dec.	(Zygomycotina), *Penicillium* (Ascomycotina), *Puccinia*
5 Dec. to 10 Dec.	*Agaricus* (Basidiomycotina), *Colletotrichum* (Deuteromycotina)
	Ultra-structure and function: Chloroplast, Mitochondria, Nucleus and Nucleolus **Chromosome**:Morphology,ultra-structure kinetochore, centromere and telomere
12 Dec. to 17 Dec.	**Cell Cycle:** General account
	Sex chromosomes and Sex determination in Plants
	Revision

Class: B.Sc. (Med.)1st Semester Subject: Botany (Practical)

Name of teacher : Dr. Savita Kadian, Ms. Mousam

From Aug 2022 to Dec 2022

Time period	Topics
22 Aug to 27 Aug.	Study parts of microscope
29 Aug.to 3 Sep.	permanent slides and material of *volvox*.
5Sep. to 10 Sep.	Permanent slides and material of *oedogonium*.
12Sep. to 17 Sep.	Permanent slides and material of *Vaucheria*.
19Sep. to 24 Sep.	Permanent slides and material of *Ectocarpus*.
26Sep. to 1 oct.	Permanent slides and material of *Polysiphonia*,
3 Oct. to 8 Oct.	Permanent slides and material of *Mucor*
10 Oct. to 19 Oct.	Permanent slides and material of *Agaricus*
	Permanent slides and material of *Coliotricum.*
27 Oct. to 5 Nov.	Permanent slides and material of *phytopthora*.
7 Nov. to 12 Nov.	Permanent slides and material of *Penicillium*
4 Nov. to 19 Nov.	Permanent slides and material of Puccinia.
21 Nov. to 26 Nov.	Permanent slides of mitosis and meiosis.

28 Nov. to 3 Dec.	Preparation of slide of onion root tip
5 Dec. to 10 Dec.	Identification of collection
12 Dec. to 17 Dec.	Preparation of slide of onion root tip
	Revision of slides, Specimens of Lichens