**GOVERNMENT PG COLLEGE, AMBALA CANTT (WEEK WISE LESSON PLAN)**

**Course file session 2022-23 (Odd Sem)**

**Name of Professor: DR. ANJU TANWAR**

**CLASS AND SECTION: B.Sc. MEDICAL, Vth Sem, SUBJECT: BOTANY**

**Paper – I Plant Physiology**

**SYLLABUS**

**Internal Assessment-10 Max. Marks – 40**

**Time– 3 Hrs.**

Note: Five questions to be attempted in all, selecting two questions from each unit. Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

**UNIT-I**

Plant-water Relations: Importance of water to plant life; physical properties of water; Imbibition, Diffusion, Osmosis and Plasmolysis; absorption and transport of water; transpiration-types, physiology of stomata, factors affecting transpiration, importance of transpiration. Mineral Nutrition: Essential macro and micro elements and their role; mineral uptake; deficiency symptoms. Transport of Organic Substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation.

**UNIT-II**

Photosynthesis: Significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photo-phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration. Respiration: ATP–the biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (chemi-osmotic theory); redox -potential; oxidative phosphorylation; pentose phosphate pathway. Seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening.

**SUGGSETED READINGS:**

1. Dennis,D.T., Turpin, D.H., Lefebvre,D.D. and Layzell (eds.). 1997: Plant Metabolism (2nd Edition), Longman, Essex, England.

2. Galston, A.W. 1989: Life Processes in Plants, Scientific American Library, Springer-Verlag, New York, USA.

3. Hopkins, W.G., 1995: Introduction to Plant Physiology, John Wiley & Sons, Inc., New York, USA.

4. Mohr, H. and Schopfer, P. 1995: Plant Physiology. Springer-Verlag, Berlin Germany.

5. Salisbury, F.B. and Ross, C.W. 1986: Plant Physiology. CBS Publishers and Distributors, New Delhi.

6. Taiz, L. and Zeiger, E. 2003: Plant Physiology. Panima Publishing Corporation, New Delhi.

**COURSE OUTCOME**

A students acquiring B.Sc. (Medical) degree will be skilled in the following fields:

* Practical Implementation and Theoretical Knowledge: Student will learn to carry out practicals in the field and Laboratory with minimal risk.
* Conservation of Botanical Gardens: Through field work in the Botanical Gardens, students are able to learn Integrated Conservation Approaches for plants. Students will also be able to learn Plant Propagation Techniques.
* Environment Sustainability: Students shall be able understand the impact of plants in Societal and Environmental contexts and demonstrate the knowledge of and need for sustainable development.
* Modern Tool Usage: Apply appropriate techniques, resources and modern instructions and equipment for Biochemical, Physiological, Molecular, Plant Tissue Culture of Plants.
* They will be able to explain various plant process, metabolism, concepts of gene, genome, experimental teachings and methods of their area of specialization in botany.
* Students visit Industries and prepare report on Sources, types and control of air and water pollution as a part of their curriculum requirement. Field exposures are given for better understanding of plant distribution and collection
* Understand the Interactions between Plants, Environment and Human Beings and our role in Environment conservation.

**Month: September, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-3 | - |
| **Week 2** | 5-10 | Plant water relations: Imbibition, Diffusion, Osmosis and Plasmolysis |
| **Week 3** | 12-17 | Transport of water: Ascent of sap,  Theories of ascent of sap |
| **Week 4** | 19-24 | Transpiration and its types (Physiology of stomata, Factors affecting transpiration, Importance of transpiration) |
| **Week 5** | 26-30 | Mechanism of mineral absorption: Passive transport & Active transport |

**Month: October, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1 | Mechanism of phloem transport: path of translocation, Mechanism of transport, Source and sink relationship |
| **Week 2** | 3-8 | Photosynthesis: definition, mechanism, historical aspect  Photosynthesis: photosynthetic pigments  Location and concept of two photosystems, |
| **Week 3** | 10-15 | Action and absorption spectrum  Photosynthesis: Z scheme, photo-phosphorylation/Light reaction (cyclic and non-cyclic) |
| **Week 4** | 17-22 | Photosynthesis: Dark reaction-Calvin cycle  Photosynthesis: C4 cycle |
| **Week 5** | 24-29 | - |

**Month: November, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-5 | Photosynthesis: CAM plants  Photosynthesis: Photorespiration |
| **Week 2** | 7-121 | Respiration: definition, historical aspect, respiratory quotient  Respiratory substrates |
| **Week 3** | 4-19 | Class test / seminar/ audio-video demonstration Mineral nutrition |
| **Week 4** | 21-26 | Diwali vacations and test |
| **Week 5** | 28-30 | Mechanism of Anaerobic respiration; Glycolysis, Krebs cycle |

**Month: December, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-3 | Electron transport mechanism (chemiosmotic), ATP the biological currency, Pentose phosphate pathway |
| **Week 2** | 5-10 | Seed dormancy, Plant Movement; Photoperiodism Physiology of flowering |
| **Week 3** | 12-17 | Florigen concept Physiology of Senescence;Fruit ripening |
| **Week 4** | 19-24 | Revision |
| **Week 5** | 26-31 | Examination |

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**Course file session 2022-23 (Odd Sem)**

**Name of Professor: DR. ANJU TANWAR**

**CLASS AND SECTION: B.Sc. MEDICAL, IstSem, SUBJECT: BOTANY**

**Paper – I Diversity of Microbes**

**SYLLABUS**

**Internal Assessment-10 Max. Marks – 40**

**Time– 3 Hrs.**

**UNIT-I**

Bacteria : Structure, nutrition, reproduction and economic importance; general account of cyanobacteria (with reference to Nostoc). Algae: General characters, classification (upto classes) and economic importance; important features and life-history (excluding development) of Volvox, Oedogonium (Chlorophyceae), Vaucheria (Xanthophyceae), Ectocrpus (Phaeophyceae) and Polysiphonia (Rhodophyceae).

**UNIT-II**

Viruses: General account of Viruses including structure of TMV and Bacteriophages. Fungi: General characters, classification (upto classes) and economic importance; important features and life-history of Phytophthora (Mastigomycotina), Mucor (Zygomycotina), Penicillium (Ascomycotina), Puccinia, Agaricus (Basidiomycotina), Colletotrichum (Deuteromycotina); General account of Lichens.

**SUGGESTED READINGS**

* Smith, G.M. 1971. Cryptogamic Botany. Vol.I. Algae & Fungi. Tata McGraw Hill Publishing Co., New Delhi. Sharma, P.D. 1991.
* The Fungi. Rastogi & Co., Meerut. Dube, H.C. 1990. An Introduction to Fungi, Vikas Publishing House Pvt.Ltd., Delhi. Clifton, A. 1958.
* Introduction to the Bacteria: McGraw Hill & Co., New York.

**After completing this course, the learner will be able to:**

1: The general characteristics of microorganisms, algae, fungi, and lichens will be understandable to students.

2: Students will acquire a conceptual grasp of bryophytes and pteridophytes.

3: Students will acquire knowledge about the fundamental features of gymnosperms.

4. Student will gain the knowledge about the practical aspects related to identification, structure, economic values of microorganisms, algae, fungi, bryophytes, pteridophytes gymnosperms, and angiosperms

**Month: September, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-3 | - |
| **Week 2** | 5-10 | Syllabus discussion, suggest reading materials  Bacteria: Structure, Nutrition, |
| **Week 3** | 12-17 | Bacteria: reproduction and economic importance |
| **Week 4** | 19-24 | General account of Cyanobacteria  Algae: General characters and classification (upto classes) |
| **Week 5** | 26-30 | Important features of Chlorophyceae  Important features and life history of *Volvox*  Systematic position, occurrence, |

**Month: October, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1 | *Volvox:* vegetative structureand Reproduction |
| **Week 2** | 3-8 | Important features and life history of *Oedogonium*  Systematic position, occurrence, vegetative structure, Reproduction, life cycle |
| **Week 3** | 10-15 | Important features of class Xanthophyceae |
| **Week 4** | 17-22 | Important features and life history of *Vaucheria*  Systematic position, occurrence, vegetative structure |
| **Week 5** | 24-29 | *Vaucheria:* reproduction and life history |

**Month: November, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-5 | Important features of class Phaeophyceae  Important features and life history of *Ectocarpus* |
| **Week 2** | 7-121 | *Ectocarpus*: Systematic position, occurrence, vegetative structure and reproduction |
| **Week 3** | 4-19 | Important features of class Rhodophyceae  Class test / seminar/ audio-video demonstration |
| **Week 4** | 21-26 | Diwali vacations and test |
| **Week 5** | 28-30 | Important features and life history of *Polysiphonia*  Systematic position, occurrence, vegetative structure |

**Month: December, 2022**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **Week 1** | 1-3 | *Polysiphonia*: reproduction |
| **Week 2** | 5-10 | General Account of Viruses |
| **Week 3** | 12-17 | General Account of Lichens |
| **Week 4** | 19-24 | Revision |
| **Week 5** | 26-31 | Examination |