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

**Course file session 2023-24 (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.

**WEEK WISE LESSON PLAN FOR THE MONTH AUGUST**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-5 Aug | Plant water relations: Imbibition, Diffusion, Osmosis and Plasmolysis |
| 2 | 7-12 Aug | Transport of water: Ascent of sap, Theories of ascent of sap |
| 3 | 14-19 Aug | Transpiration and its types (Physiology of stomata, Factors affecting transpiration, Importance of transpiration) |
| 4 | 21-26 Aug | Mineral nutrition  Mechanism of mineral absorption: Passive transport & Active transport |
| **5** | 28-31 Aug | Mechanism of phloem transport: path of translocation, Mechanism of transport, Source and sink relationship |

**WEEK WISE LESSON PLAN FOR THE MONTH SEPTEMBER**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-2 Sep | Photosynthesis: definition, mechanism, historical aspect  Photosynthesis: photosynthetic pigments  Location and concept of two photosystems, |
| 2 | 4-9 Sep | Action and absorption spectrum  Photosynthesis: Z scheme, photo-phosphorylation/Light reaction (cyclic and non-cyclic) |
| 3 | 11-16 Sep | Photosynthesis: Dark reaction-Calvin cycle |
| 4 | 18-23 Sep | Photosynthesis: C4 cycle |
| **5** | 25-30 Sep | Photosynthesis: CAM plants  Photosynthesis: Photorespiration |

**WEEK WISE LESSON PLAN FOR THE MONTH OCTOBER**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 2-7 Oct | Respiration: definition, historical aspect, respiratory quotient,  Respiratory substrates |
| **2** | 9-14 Oct | Class test / seminar/ audio-video demonstration |
| **3** | 16-21 Oct | Mechanism of Anaerobic respiration |
| **4** | 23-28 Oct | Glycolysis, Krebs cycle  Electron transport mechanism (chemiosmotic), |
| **5** | 30-31 Oct | ATP the biological currency, Pentose phosphate pathway |

**WEEK WISE LESSON PLAN FOR THE MONTH NOVEMBER**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-4 Nov | Seed dormancy, Plant Movement  Photoperiodism Physiology of flowering |
| **2** | 6-11 Nov | Diwali Vacations |
| **3** | 13-18 Nov | Florigen concept Physiology of Senescence  Fruit ripening |
| **4** | 20-25 Nov | Revision of the whole syllabus   * Through audio-visual practice |
| **5** | 27-30 Nov | Diagram practice, Specimen and slide study   * Group discussion, Seminars and power point presentations   Oral and written tests |

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

**Course file session 2023-24 (Odd Sem)**

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

**CLASS AND SECTION: BCA, 1st Sem, SUBJECT:MDC- BOTANY**

**Course Code B23-BOT-104; Course Type: MDC-1**

**Name of the Course: Fundamentals of Botany**

**SYLLABUS**

**Credits Contact Hours**

Theory 2 2

Practical 1 2

Total 3 4

**THEORY-** Max. Marks: 50; Internal Assessment Marks: 15; End Term Exam Marks: 35; Time: 3 Hours

**PRACTICAL-**Max. Marks: 25; Internal Assessment Marks: 05; End Term Exam Marks: 20; Time: 4 Hours

Instructions for Paper- Setter

1. Nine questions will be set in all. All questions will carry equal marks.

2. Question No.1 will be short answer type covering the entire syllabus and will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each unit. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

**Unit I (contact hours 7)**

General characteristics, morphology and economic importance of viruses, bacteria algae, fungi and lichens.

**Unit II (contact hours 7)**

General characteristics, morphology and economic importance of Bryophytes and Pteridophytes.

**Unit III (contact hours 8)**

General characteristics, morphology and economic importance Gymnosperms.

**Unit IV (contact hours 8)**

IV General characteristics, morphology and economic importance of Angiosperms.

**Unit V (contact hours 30)**

Cynobacteria&Algae: Study of slides of Nostoc and Volvox through permanent slides.

* Penicillium: Asexual stage and sexual structures through permanent slides.
* Agaricus: Specimens of button stage and full grown mushroom.
* Marchantia & Funaria- morphology of thallus through permanent slides.
* Selaginella & Equisetum- morphology specimen study.
* Cycas & Pinus - morphology specimen study.
* Study of vegetative and floral characters of the one or two
* members of some important families
* Excursion Report: Report on excursion tours with photographs, collection, preservation and preparation of herbarium sheets and specimens related to Archegoniates and Angiosperms.
* Mounting of a collected, properly dried and pressed specimen of minimum 20 wild plants with herbarium label.

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Wiley, J.M., Sherwood, L.M. and Woolverton, C.J. (2019) Prescott’s Microbiology. 11th Edition. McGraw Hill International.
2. Lee, R.E. (2018) Phycology. 5th Edition. Cambridge University Press.
3. Ahluwalia, A.S. (2020). Phycology: Principles, Processes and Applications. Daya Publishing House, New Delhi.
4. Dube, H.C. (2012). An Introduction to Fungi, Vikas Publishing House Pvt. Ltd., Delhi. 4th edition.
5. Mehrotra,R.S. and Aggarwal, Ashok (2013) Fundamentals of Plant Pathology, Tata McGraw-Hill Publishing company Ltd, New Delhi
6. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.
7. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
8. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi, India.
9. Sharma, O.P. (2017). Text Book of Pteridophyta, McMillan India Ltd.
10. Thakur, A.K. and Bassi, S.K. (2008). Diversity of Microbes and Cryptogams. S. Chand & Co., Delhi.
11. Vanderpoorten, A. & Goffinet, B. (2009) Introduction to Bryophytes. Cambridge University Press.
12. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India
13. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Gymnosperms, S. Chand. Delhi, India
14. Pandey, B.P. (2001). A Textbook of Botany-Angiosperms, S. Chand. Delhi, India

**Course Learning Outcomes(CLO):** After completing this course, the learner will be able to:

1: Students will gain a foundational understanding of the biology of microorganisms, algae, fungi and lichens.

2: Students will develop a conceptual understanding of bryophytes and pteridophytes.

3: Students will acquire knowledge about the fundamental characteristics of gymnosperms and the challenges related to their propagation.

4: Students will acquire a basic understanding of angiosperm morphology.

5\*. Students will be able to learn the practical aspects of microorganisms, algae, fungi and students will be able to identify the major groups of plants and compare the characteristics of higher plants(angiosperms and gymnosperms)and lower plants (bryophytes and pteridophytes).

**WEEK WISE LESSON PLAN FOR THE MONTH AUGUST**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-5 Aug | - |
| 2 | 7-12 Aug | - |
| 3 | 14-19 Aug | - |
| 4 | 21-26 Aug | Introduction of syllabus |
| **5** | 28-31 Aug | General characteristics, morphology and economic importance of viruses |

**WEEK WISE LESSON PLAN FOR THE MONTH SEPTEMBER**

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| --- | --- | --- |
| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-2 Sep | General characteristics, morphology and economic importance of bacteria |
| 2 | 4-9 Sep | General characteristics, morphology and economic importance of algae |
| 3 | 11-16 Sep | General characteristics, morphology and economic importance of fungi and lichens |
| 4 | 18-23 Sep | General characteristics, morphology and economic importance of Bryophytes |
| **5** | 25-30 Sep | General characteristics of Pteridophytes. |

**WEEK WISE LESSON PLAN FOR THE MONTH OCTOBER**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 2-7 Oct | Morphology and economic importance of Pteridophytes. |
| **2** | 9-14 Oct | General characteristics of Gymnosperms |
| **3** | 16-21 Oct | Morphology and economic importance Gymnosperms |
| **4** | 23-28 Oct | General characteristics of Angiosperms |
| **5** | 30-31 Oct | Dicot and Monocot plants  Flower TS discussion |

**WEEK WISE LESSON PLAN FOR THE MONTH NOVEMBER**

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| **Week no** | **Schedule dates** | **Topics to be covered** |
| **1** | 1-4 Nov | Morphology of Angiosperms |
| **2** | 6-11 Nov | Diwali Vacations |
| **3** | 13-18 Nov | Economic importance of Angiosperms |
| **4** | 20-25 Nov | Revision of the whole syllabus   * Through audio-visual practice |
| **5** | 27-30 Nov | Diagram practice, Specimen and slide study   * Group discussion, Seminars and power point presentations   Oral and written tests |

Dr. Anju Tanwar