

DEPARTMENT OF BOTANY
COURSE CURRICULUM & MARKING SCHEME

B.Sc. I, II, III, IV Semester

BOTANY

(Based on Choice Based Credit System)

SESSION : 2023-24



ESTD : 1958

**GOVT. V.Y.T. PG AUTONOMOUS COLLEGE,
DURG, 491001 (C.G.)**

(Former Name – Govt. Arts & Science College, Durg)

NAAC Accredited Grade A⁺, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

Phone : 0788-2212030

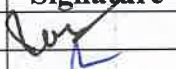
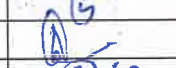
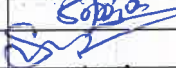
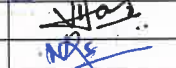
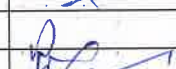
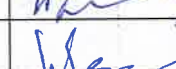








Website - www.govtsciencecollegedurg.ac.in, Email – autonomousdurg2013@gmail.com

GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE, DURG (C.G.)
Syllabus and Marking Scheme for B.Sc. Semester- I and II

SESSION: 2023-2024

Paper No.	Title of the Paper	Marks Allotted in Theory		Marks Allotted in Internal Assessment	
		Max	Min	Max	Min
First Semester (Course Code- BBO101)	Biodiversity (Microbes, Algae, Fungi and Archegoniate) (03 Credit)	60	12	15	03
BBOL01	Lab Course/ Practical (01 Credit)	25	05		
	Total	100			
Second Semester (Course Code- BBO102)	Plant Ecology and Taxonomy (03 Credit)	60	12	15	03
BBOL02	Lab course/ Practical (01 Credit)	25	05		
	Total	100			

Name and Signatures of Members Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson:	Dr. Ranjana Shrivastava	
2.	Members	1. Prof. Smt. Gayatri Pandey	
		2. Dr. G. S. Thakur	
		3. Dr. Shriram Kunjam	
		4. Dr. Satish Kumar Sen	
		5. Dr. Vijay Laxmi Naidu	
		6. Mr. Motiram Sahu	
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7.	Subject expert from other Department	Dr. DivyaMinz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)

Department of Botany

2023-2024

B.Sc. Semester -I (CBCS)

(Course Code- BBO101)

Core Course: Biodiversity (Microbes, Algae, Fungi and Archegoniate)

(Credits: 04, Theory-3, Practicals-1)

THEORY

Lectures: 60

M. Marks: 60

Course Outcome

On completion of the course, students are able to:

CO 1: To define the microbes and explain structure and types of viruses and bacteria.

CO 2: To explain the reproduction and economic importance of viruses and bacteria.

CO 3: To discuss the general characters, distribution and range of thallus organization of algae.

CO 4: To describe the classification, Morphology, life cycle and economic importance of algae.

CO 5: State the diversity, general characters, classification and nutrition of Fungi, Lichen and Mycorrhiza.

CO 6: To describe life cycle and economic importance of fungi, lichen and mycorrhiza.

CO 7: To define Archegoniate and alternation of generation

CO 8: To discuss general characters, classifications, life cycle and economic importance of Bryophytes, Pteridophytes and Gymnosperm.

Unit 1: Microbes

(10 Lectures)

Viruses – Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance;

Bacteria – Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit 2: Algae

(12 Lectures)

General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and life-cycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Ectocarpus*, *Polysiphonia*. Economic importance of algae.

Unit 3: Fungi

(12 Lectures)

Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, ecology and significance, life cycle of *Rhizopus* (Zygomycota) *Penicillium*,

Peziza (Ascomycota), *Puccinia* (Basidiomycota) *Alternaria* (Deuteromycota); Symbiotic Associations-Lichens: General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and endomycorrhiza and their significance

Unit 4: Introduction to Archegoniate

(12 Lectures)

Unifying features of archegoniates, Transition to land habit, Alternation of generations.

Bryophytes: General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (**Developmental details not to be included**). Ecology and economic importance of bryophytes.

Unit 5: Pteridophytes and Gymnosperms

(14 Lectures)

Pteridophytes: General characteristics, classification, Early land plants (*Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella* and *Equisetum*. (**Developmental details not to be included**). Heterospory and seed habit, stelar evolution. Ecological and economical importance of Pteridophytes.

Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of *Cycas* and *Pinus*. (**Developmental details not to be included**). Ecological and economical importance.

Practical

1. EMs/Models of viruses – T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Ectocarpus* and Polysiphonia through temporary preparations and permanent slides. (* Ectocarpus - Specimen and permanent slides)
5. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. *Alternaria*: Specimens/photographs and tease mounts.
7. *Puccinia*: Herbarium specimens of Black Stem Rust of Wheat and infected Barberryleaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. *Agaricus*: Specimens of button stage and full-grown mushroom; Sectioning of gills of *Agaricus*.

9. *Lichens*: Study of growth forms of lichens (crustose, foliose and fruticose)
10. *Mycorrhiza*: Ecto mycorrhiza and endo mycorrhiza (Photographs)
11. *Marchantia*- morphology of thallus, W.M. rhizoids and scales, V.S. thallus through gemma cup, W.M. gemmae (all temporary slides), V.S. antheridiophore, archegoniophore, L.S. sporophyte (all permanent slides).
12. *Funaria*- morphology, W.M. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, L.S. capsule and protonema.
13. *Selaginella*- morphology, W.M. leaf with ligule, T.S. stem, W.M. strobilus, W.M. microsporophyll and megasporophyll (temporary slides), L.S. strobilus (permanent slide).
14. *Equisetum*- morphology, T.S. internode, L.S. strobilus, T.S. strobilus, W.M. sporangiophore, W.M. spores (wet and dry) (temporary slides); T.S. rhizome (permanent slide).
15. *Cycas*- morphology (coralloid roots, bulbil, leaf), T.S. coralloid root, T.S. rachis, V.S. leaflet, V.S. microsporophyll, W.M. spores (temporary slides), L.S. ovule, T.S. root (permanent slide).
16. *Pinus*- morphology (long and dwarf shoots, W.M. dwarf shoot, male and female), W.M. dwarf shoot, T.S. needle, T.S. stem, L.S./T.S. male cone, W.M. microsporophyll, W.M. microspores (temporary slides), L.S. female cone, T.L.S. & R.L.S. stem (permanent slide).

Suggested Readings

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd

Publishers, New Delhi, India.

8. Parihar, N.S. (1991). An introduction to Embryophytes. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Practical Scheme

Time: 3Hrs

M.M. 25

1. Microbiology/Algae	04
2. Fungi/Bryophytes	04
3. Pteridophytes/Gymnosperm	04
4. Spotting (1-5)	05
5. Project/Field work	02
5. Viva-voce	02
6. Sessional	04

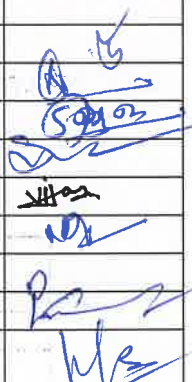
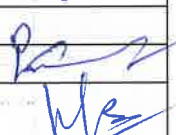
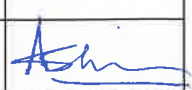
Question Paper Format and Distribution of Marks for Under Graduate Examination

1. The question paper for UG Classes is to be divided into three Sections - A, B & C.
2. Section A shall contain very short answer type questions (answer in one or two sentences) or objective type questions. (No Multiple choice questions. No 'fill in the blank' type Questions)
3. Section B shall contain short answer type questions with the limit of 150 words.
4. Section C shall contain long answer/descriptive type questions. The students are required to answer precisely and the answer should not exceed the limit of 350 words.
5. The scheme of marks should be as follows:

Question Type	MM 60 (Marks x No. of Questions)
A (Very short Answer)	1x10 = 10
B (Short Answer)	3x5 = 15
C (Long Answer)	7x5 = 35

The half yearly internal examinations will be held. 10% out of marks obtained by the students in each paper in internal examinations will be added to 90% of marks obtained in each paper of annual examination.

Name and Signatures of Members Board of Studies

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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)

Department of Botany

2023-2024

B.Sc. Semester -II (CBCS)

(Course Code- BBO102)

Core Course: Plant Ecology and Taxonomy

(Credits: Theory-3, Practicals-1)

THEORY

Lectures: 60

M. Marks: 60

Course Outcome

On completion of the course, students are able to:

CO 1: To define the plant ecology and describe various ecological factors in living system.

CO 2: To understand about the inter relationship between living world and environment.

CO 3: To understand about the fundamental aspect of ecosystem and phytogeography.

CO 4: To define taxonomy and types of classification systems.

CO 5: To describe general taxonomic rule on plant classification.

CO 6: To understand about the process of plant description and identification.

Unit 1: Introduction of plant ecology (12 Lectures)

Ecological factors: Soil: -Origin, formation, composition, soil profile. **Water:** States of water in the environment, precipitation types. **Light and temperature:** Variation Optimal and limiting factors; Adaptation of hydrophytes and xerophytes.

Unit 2: Plant communities and Ecosystem (12 Lectures)

Characters; Ecotone and edge effect; Succession; Processes and types.

Ecosystem: Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids, Biogeochemical cycling: Cycling of carbon, nitrogen and Phosphorous

Unit 3: Introduction to plant taxonomy (14 Lectures)

Botanical nomenclature: Principles and rules (ICBN); ranks and names; binominal system, typification, principle of priority and its limitations.

Herbarium techniques; important herbaria and botanical gardens of the world and India; Taxonomic evidences from cytology and phytochemistry.

Unit 4: System of Classification and Numerical taxonomy (10 Lectures)

Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (up to series).

Numerical taxonomy: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).

Unit 5: Systematic study of taxonomic plants

(12 Lectures)

Study of vegetative and floral characters of the following families: Fabaceae, Brassicaceae, Malvaceae, Asteraceae, Apocynaceae, Apiaceae, Solanaceae, Lamiaceae and Liliaceae.

Practical

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each).
(b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (Species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Brassicaceae -*Brassica*, *Alyssum* / *Iberis*; Malvaceae- *Hibiscus-rosa-sinensis*, Asteraceae -*Sonchus/Launaea/Vernonia/Ageratum*, *Eclipta/Tridax*; Apocynaceae-*Thevetia*, Solanaceae -*Datura/Withania*; Lamiaceae -*Salvia/ Ocimum*; Liliaceae - *Asphodelus / Lilium / Allium*.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

Practical Scheme

Time: 3Hrs	M.M. 25
1. Morphological and Anatomical adaptations / Soil Test	04
2. Quantitative analysis of plants	04
3. Plant Description	04
4. Spotting (1-5)	05
5. Project/Field work	02
6. Viva-voce	02
7. Sessional	04

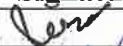

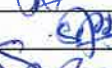
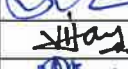





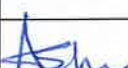




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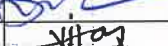
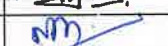








GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG
Syllabus and Marking Scheme for B.Sc. Semester- III & IV

Subject-Botany

SESSION: 2023-2024

Paper No.	Title of the Paper	Marks Allotted in Theory		Marks Allotted in Internal Assessment	
		Max	Min	Max	Min
Third Semester (Course Code- BBO103)	Plant Anatomy and Embryology (03 Credit)	60	24	15	04
BBOL03	Lab Course/ Practical (01 Credit)	25	7		
	Total	100			
Four Semester (Course Code- BBO104)	Plant Physiology (03 Credit)	60	24	15	04
BBOL04	Lab course/ Practical (01 Credit)	25	7		
	Total	100			

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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)

Department of Botany

2023-2024

B.Sc. Semester -III (CBCS)

(Course Code- BBO103)

CORE COURSE: PLANT ANATOMY AND EMBRYOLOGY

(Credits: 04 Theory-3, Practicals-1)

THEORY

Lectures: 50

M. Marks: 60

Course Outcome:

On completion of the course, students are able to –

- CO 1: Know importance and scope of Plant Taxonomy and Embryology
- CO 2: Understand the plant Shoot and Root Apex organization.
- CO 3: Understand the process secondary growth in Plants.
- CO 4: Will get the knowledge of different types of tissue system and wood structure in plants.
- CO 5: Learn about the reproduction in Plants.
- CO 6: Understand the Anatomical anomalies in Plants.
- CO 7: Learn and understand about Pollination mechanism in plants

UNIT-I

(10 Lectures)

Shoot Apex and Types, Classification of Meristematic Tissue, Theory related to shoot Apex organization, Root Apex and Types, Theory related to Root Apex organization. Permanent Tissue and types, Tissue system, epidermal tissue system, Ground tissue system and Vascular tissue system

UNIT-II

(10 Lectures)

Internal Structure of Dicot and Monocot Root, Internal Structure of Dicot and Monocot Stem, Internal Structure of Dicot and Monocot Leaf, Secondary Growth in Dicot and Monocot Stem and its Significance, Wood and Wood Structure, Periderm, Differentiation of Secondary Tissues in Stem

UNIT-III

(10 Lectures)

Anatomical anomalies in the primary structure of Dicot and Monocot Stems (Nyctanthes, Boerhaavia, Casuarina), Anomalous Secondary Growth in Dracaena, Bignonia, Laptadenia.

UNIT-IV

(10 Lectures)

Flower as a reproductive organ, Anther and Development of Male Gametophyte, Ovule and its type, Development of Female Gametophyte.

UNIT-V

(10 Lectures)

Mechanisms and types of Pollination, Self-incompatibility, Fertilization and Events of Fertilization, Endosperm and its type, Embryo and its Development, Polyembryony, Apomixes and Parthenocarpy.

Books Recommended:

1. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
2. Pandey, BP, Plant Anatomy, S.Chand Publishing, New Delhi
3. Bhojwani, SS and Bhatanagar SP, Embryology of Angiosperm, Vikas Publication House, New Delhi
4. Singh, Pandey, Jain, Embryology of Angiosperms, Rastogi Publication, Meerut
5. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
6. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
7. Evert, R.F. (2006) Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function and Development. John Wiley and Sons, Inc.

Question Paper Format and Distribution of Marks for Under Graduate Examination

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5. The scheme of marks should be as follows:

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A (Very short Answer)	1x10 = 10
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The half yearly internal examinations will be held. 10% out of marks obtained by the students in each paper in internal examinations will be added to 90% of marks obtained in each paper of annual examination.

**B.Sc. – Semester III
BOTANY (PRACTICAL)**

1. Anatomical characteristics of hydrophytes and xerophytes.
2. Anatomy of Monocot/Dicot stem/leaf/root.
3. Primary anomalous structure of stem (*Nyctanthes*, *Boerhaavia*) and Anomalous secondary growth in *Dracaena*, *Bignonia*.
4. Study the structure of Pollen Grain {eg. *Brassica*, *Hibiscus*, *Datura*, *Solanum*}.
5. Study the different types of Placentation (Axile, Basal, Marginal Parietal, Free central) {eg. Pea, Hibiscus, Brassica, Sunflower, Dianthus}.
6. Stem: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary: *Helianthus* (only Permanent slides).
7. Root: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary: *Helianthus* (only Permanent slides).
8. Leaf: Dicot and Monocot leaf (only Permanent slides).
9. Adaptive anatomy: Xerophyte (*Nerium* leaf); Hydrophyte (*Hydrilla* stem).
10. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
11. Types of ovules: Anatropous, Orthotropous, Circinotropous, Amphitropous/ Campylotropous.
12. Calculation of percentage of germinated pollen in a given medium.

PRACTICAL SCHEME

	TIME: 4 Hrs.	M.M.: 25
1.	1. Anatomy	07
2.	3. Embryology	05
3.	8. Project Work/Field Study/Economic Botany	03
4.	6. Spotting	05
5.	7. Viva-Voce	03
6.	9. Sessional	02
7.		
8.		
9.		
10.		
11.		
12.		

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1.	Chairperson	Dr. Ranjana Shrivastava	
2.	Members	1. Prof. Smt. Gayatri Pandey	
		2. Dr. G. S. Thakur	
		3. Dr. Shriram Kunjam	
		4. Dr. Satish Kumar Sen	
		5. Dr. Vijay Laxmi Naidu	
		6. Mr. Motiram Sahu	
		7. Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
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6.	Ex Meritorious Student PG	Ashwin Gautam	
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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)

Department of Botany

2023-2024

B.Sc. Semester -IV (CBCS)

(Course Code- BBO104)

CORE COURSE: PLANT PHYSIOLOGY

(Credits 4: Theory-3, Practicals-1)

THEORY

Lectures: 50

M. Marks: 60

Course Outcome:

On completion of the course, students are able to -

- CO 1: Know importance and scope of plant physiology
- CO 2: Understand the plant and plant cells in relation to water
- CO 3: Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reaction C3 and 4 pathways.
- CO 4: Will get the knowledge of respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
- CO 5: Learn about the movement of sap and absorption of water in plant body.
- CO 6: Understand the plant movement
- CO 7: Learn and understand about mineral nutrition in plants.

UNIT-I

(10 Lectures)

Plant water relations: Diffusion, permeability, osmosis, imbibition, Plasmolysis, osmotic potential and water potential, Types of soil water, water holding capacity, wilting, Absorption of water, theories of Ascent of sap.

UNIT-II

(10 Lectures)

Transpiration, stomatal movement, significance of transpiration, Factors affecting transpiration, guttation. Mineral nutrition and absorption, Deficiency symptoms, Biological Nitrogen fixation. Mechanism of Nitrate uptake & reduction, ammonium assimilation.

UNIT-III

(10 Lectures)

Photosynthesis: Photosynthetic apparatus and pigments, light reaction mechanism of ATP synthesis. Photooxidation of water, mechanism of electron & proton transport (Hill reaction). C3, C4, CAM pathway of carbon reduction, photorespiration, factors affecting photosynthesis.

UNIT-IV

(10 Lectures)

Respiration: Aerobic and anaerobic respiration, Glycolysis, Krebs's cycle, factors affecting respiration, R.Q. Glyoxylate pathway, Alternative Oxidase system, Pentose Phosphate pathway.

UNIT-V

(10 Lectures)

Plant growth hormones: Auxin, Cytokinin, Gibberellin, Ethylene and Abscisic acid. Physiology of flowering, Florigen concept, Phytochromes & Cryptochromes, Photoperiodism and Vernalization. Seed dormancy and germination, Plant movement.

Books Recommended:

1. Hopkins, WG and Huner, PA. Introduction to Plant Physiology, John Wiley and Sons.
2. Pandey SN and Sinha BK, Plant Physiology, Vikas Publishing, New Delhi
3. Taiz, L and Zeiger. E. Plant Physiology, 5th edition, Sinauer Associates Inc. M.A, USA
4. Srivastava, HS Plant Physiology and Biotechnology, Rastogi Publications, Meerut.
5. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.



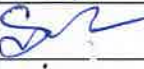




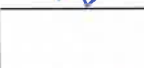



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6.	Ex Meritorious Student PG	Ashwin Gautam	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG Autonomous College Durg C.G.)	

**B.Sc. – Semester IV
BOTANY (PRACTICAL)**

1. Demonstration of transpiration.
2. To determine the rate of transpiration by Ganong's photometer.
3. Demonstration of evolution of O₂ in photosynthesis, factors affecting of photosynthesis.
4. Comparison of R.Q. of different respiratory substrates.
5. To determine the rate of transpiration by four leaf method.
6. To find out stomatal index of different mesophytic leaves.
7. Determination of osmotic potential of plant cell sap by plasmolytic method.
8. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
9. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
10. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.
11. Comparison of the rate of respiration in any two parts of a plant.
12. Separation of amino acids by paper chromatography.

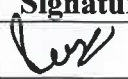




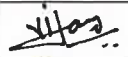




PRACTICAL SCHEME

TIME: 4 Hrs.

M.M.: 25

1. Physiology	07
3. Photoperiodism	05
8. Project Work/Field Study/Economic Botany	03
6. Spotting	05
7. Viva-Voce	03
9. Sessional	02

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