

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE

RAJNANDGAON (C.G.)



FYUP

(Four Year Undergraduate Programme)

Course Curriculum

**FOR
B.Sc. BOTANY**

**Semester V and Semester VI
SESSION – 2025-26**

Approved by

Central Board Of Studies & Board Of Studies

DEPARTMENT OF BOTANY

Govt. Digvijay Autonomous P.G. College, Rajnandgaon, C.G.
Bachelor of Science (B.Sc.) Four Years UG Programme (FYUP)

Botany

2025-26

Year	Sem.	Course Type	Course Title	Credit	IA	ESE	Max Marks
First Year	I Sem.	DSC-01	Elementary Botany	3+0+0	30	70	100
		DSC-01-LAB	Elementary Botany – LAB	0+0+1	15	35	50
		GE-01	Elementary Botany	3+0+0	30	70	100
		GE-01-LAB	Elementary Botany – LAB	0+0+1	15	35	50
	II Sem.	DSC-02	Microbes and Thallophyta	3+0+0	30	70	100
		DSC-02-LAB	Microbes and Thallophyta - LAB	0+0+1	15	35	50
		GE-02	Microbes and Thallophyta	3+0+0	30	70	100
		GE-02-LAB	Microbes and Thallophyta - LAB	0+0+1	15	35	50
		SEC-01	Gardening and Floriculture	0+0+2	10	40	50
Second Year	III Sem.	DSC-03	Archegoniate and Fossils	3+0+0	30	70	100
		DSC-03-LAB	Archegoniate and Fossils – LAB	0+0+1	15	35	50
		DSE- 01	Natural resources and management	3+0+0	30	70	100
		DSE-01-LAB	Natural resources and management- LAB	0+0+1	15	35	50
		VAC- 01	Herbal Plants & Human Health	2+0+0	10	40	50
	IV Sem.	DSC- IV	Angiosperms	3+0+0	30	70	100
		DSC- IV- LAB	Angiosperms- LAB	0+0+1	15	35	50
		DSE-02	Microbiology and Phytopathology	3+0+0	30	70	100
		DSE-02-LAB	Microbiology and Phytopathology- LAB	0+0+1	15	35	50
		SEC- 02	Flower Decoration	0+0+2	10	40	50



Third Year	V Sem.	DSC-05	Plant Physiology	3+0+0	20	80	100
		DSC-05-LAB	Plant Physiology- LAB	0+0+1	10	40	50
		DSE-03	Plant Metabolism	3+0+0	20	80	100
		DSE-03-LAB	Plant Metabolism- LAB	0+0+1	10	40	50
		DSE-04	Plant Diseases	3+0+0	20	80	100
		DSE-04-LAB	Plant Diseases-LAB	0+0+1	10	40	50
		SEC-03	Biofertilizer and Biopesticides	0+0+2	10	40	50
	VI Sem.	DSC-06	Plant Pathology	3+0+0	20	80	100
		DSC-06-LAB	Plant Pathology-LAB	0+0+1	10	40	50
		DSE-05	Molecular Biology and Plant Biotechnology	3+0+0	20	80	100
		DSE-05-LAB	Molecular Biology and Plant Biotechnology-LAB	0+0+1	10	40	50
		DSE-06	Economic Botany	3+0+0	20	80	100
		DSE-06-LAB	Economic Botany-LAB	0+0+1	10	40	50
		SEC-04	Mushroom Culture Technology-Project	0+0+2	10	40	50
Fourth Year Bachel or of Honors	VII Sem.	DSC-07	Ecology and Phytogeography	3+0+0	20	80	100
		DSC-07-LAB	Ecology and Phytogeography-LAB	0+0+1	10	40	50
		DSE-07	Instrumentation and Biochemical Technology	3+0+0	20	80	100
		DSE-07-LAB	Instrumentation and Biochemical Technology-LAB	0+0+1	10	40	50
		DSE-08	Biosystematics and Biodiversity	3+0+0	20	80	100
		DSE-08-LAB	Biosystematics and Biodiversity-LAB	0+0+1	10	40	50
		DSE-09	Plant Breeding and Seed Technology	3+0+0	20	80	100
		DSE-09-LAB	Plant Breeding and Seed Technology-LAB	0+0+1	10	40	50
		GE-	Growth and Stress Physiology	3+0+0	20	80	100
		GE-LAB	Growth and Stress Physiology-LAB	0+0+1	10	40	50
	VIII Sem	DSC-08	Molecular Biology and Biostatistics	3+0+0	20	80	100
		DSC-08-	Molecular Biology and	0+0+1	10	40	50

Fourth Year Bachelor of Honors with Research		LAB	Biostatistics- LAB				
		DSE-10	Plant Biotechnology and Crop Improvement	3+0+0	20	80	100
		DSE-10-LAB	Plant Biotechnology and Crop Improvement-LAB	0+0+1	10	40	50
		DSE-11	Applied Botany and Intellectual Property Right (IPR)	3+0+0	20	80	100
		DSE-11-LAB	Applied Botany and Intellectual Property Right (IPR)-LAB	0+0+1	10	40	50
		DSE-12	Biochemistry and Enzymology	3+0+0	20	80	100
		DSE-12-LAB	Biochemistry and Enzymology-LAB	0+0+1	10	40	50
		DSE-13	Bioinformatics and Genetic Technology	3+0+0	20	80	100
		DSE-13-LAB	Bioinformatics and Genetic Technology-LAB	0+0+1	10	40	50
	VII Sem.	DSC-07	Ecology and Phytogeography	3+0+0	20	80	100
		DSC-07-LAB	Ecology and Phytogeography-LAB	0+0+1	10	40	50
		DSE-07	Research Methodology and Ethics	4+0+0	20	80	100
		DSE-08	Biosystematics and Biodiversity	3+0+0	20	80	100
		DSE-08-LAB	Biosystematics and Biodiversity-LAB	0+0+1	10	40	50
		DSE-09	Plant Breeding and Seed Technology	3+0+0	20	80	100
		DSE-09-LAB	Plant Breeding and Seed Technology-LAB	0+0+1	10	40	50
		GE-	Growth and Stress Physiology	3+0+0	20	80	100
		GE-LAB	Growth and Stress Physiology-LAB	0+0+1	10	40	50
	VIII Sem	DSC-08	Molecular Biology and Biostatistics	3+0+0	20	80	100
		DSC-08-LAB	Molecular Biology and Biostatistics- LAB	0+0+1	10	40	50
		DSE-10	Plant Biotechnology and Crop Improvement	3+0+0	20	80	100
		DSE-10-LAB	Plant Biotechnology and Crop Improvement-LAB	0+0+1	10	40	50
		Research Project/ Dissertation		12			

B.Sc. – V Semester

BOTANY

B. Sc. – V Semester (BOTANY)

2025-26

Session: 2025-26	Program: B.Sc.
Semester: V	Subject: Botany
Course type: DSC/ Core course- 05	Course code:
Title of DSC/Core Course- 05	Plant Physiology
Credits: 03	Lecture: 45
Maximum Marks: 100	Minimum Passing Marks: 40

Title	Plant Physiology
Course outcomes	<ul style="list-style-type: none">➤ This course aims to educate student about the mechanism and physiology life processes in plants.➤ It focus on the plant nutrient uptake and translocation,➤ Know about how photosynthesis and respiration occur in plants.➤ Know about how respiration & nitrogen metabolism occur in plants.
Learning outcomes	<ul style="list-style-type: none">➤ Students will be able to understand the various physiological life processes in plants➤ They will also gain about the various uptake and transport mechnisms in plants and are able to coordinate the various processes.➤ They understand the role of various harmones, signaling compounds, thermodynamics and enzyme kinetics.➤ During the course students will gain knowledge about various mechanisms such as channel or transport proteins involved in nutrient uptake in plants.

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B. Sc. V Semester (BOTANY)
DSC/ Core Course -05

2025-26

Plant Physiology			
Title			
Units	Lectures	Credit	Syllabus
I	12	3	Plant Water Relation: 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.
II	10		Mineral Nutrition and Absorption, Deficiency Symptoms. Transpiration, Stomatal movement, Significance of Transpiration, Factors affecting Transpiration, Guttation.
III	13		Photosynthesis: Photosynthetic apparatus and Pigments, Light reaction, Mechanism of ATP Synthesis. C3 cycle, C4 cycle, CAM pathway of Carbon reduction, Photorespiration, factors affecting Photosynthesis. Respiration: Aerobic and Anaerobic respiration, Glycolysis, Krebs cycle, R.Q., Factors affecting respiration.
IV	10		Plant Growth Hormones: Auxin, Gibberellin, Cytokinin, Ethylene and Abscissic acid. Physiology of Flowering, Florigen concept, Photoperiodism and Vernalization, Seed dormancy and Germination, Plant Movement.
Total	45 Lectures	3 Credit	

Evaluation Scheme for Theory

Exam Type	Marks
End Term Exam	80
Internal Exam	20
Total marks	100

Bas *RP*

B. Sc. V Semester (BOTANY)
2025-26
DSC/ Core Course Practical -05
Plant Physiology-LAB

Practical Scheme (1 Credit)

1. Physiological experiment major	10
2. Physiological experiment minor	10
3. Instrumentation based on physiology	10
4. Spotting	10
5. <i>Viva-voce</i>	05
6. Sessional	05

Total Marks: 50

CCS PY

B. Sc. – V Semester (BOTANY)

2025-26

Session: 2025-26	Program: B.Sc.
Semester: V	Subject: Botany
Course type: DSE – 03	Course code:
Title of DSE – 03	Plant Metabolism
Credits: 03	Lecture: 45
Maximum Marks: 100	Minimum Passing Marks: 40

Title	Plant Metabolism
Course outcomes	<ul style="list-style-type: none">➤ This course aims to educate student about the various metabolic pathways.➤ Know about enzymes, its classification and their mode of action.➤ Know about lipid metabolism, structure and functions.➤ Know about Biological nitrogen fixation and nodule formation in plants➤ Study thermodynamics and its application in plant sciences.➤ Study the role of signaling and different signaling pathways.
Learning outcomes	<ul style="list-style-type: none">➤ The student will enrich themselves with the phenomenon of metabolism process and their role in plants.➤ Understand the signaling mechanism in plants.➤ Learn about enzymes structure and mechanism of action.➤ Understand about lipid metabolism and nitrogen fixation mechanism.➤ Understand the thermodynamics laws and its role in plant biology.

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B. Sc. V Semester (BOTANY)
DSE – 03

Title			Plant Metabolism
Units	Lectures	Credit	Syllabus
I	13	3	Enzymes: Classification of enzyme, Chemical nature and structure of enzymes, Properties of enzymes. Co-enzyme. Mechanism of enzyme action, Different mechanism of enzyme action, inhibition of enzyme action, enzyme kinetics: Michaelis-Menten equation, Biological significance of enzyme.
II	12		Lipid metabolism: Structure and function of lipids, Fatty acid biosynthesis. Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis. Protein: Structure of Amino acid, Peptide bonds, Structure of protein: Primary, Secondary, Tertiary and Quaternary.
III	10		Nitrogen metabolism: Biological nitrogen fixation, Nodule formation and Nod factors. Mechanism of nitrate uptake and reduction, Nitrate assimilation, Ammonia assimilation and transamination.
IV	10		Energy Flow: Principals of Thermodynamics, Free energy and Redox reaction Signal Transduction: Receptors and G-Protein, Phospholipid signaling, Calcium–Calmodulin Cascade.
Total	45 Lectures	3 Credit	

Evaluation Scheme for Theory

Exam Type	Marks
End Term Exam	80
Internal Exam	20
Total marks	100

CCS *PR*

B. Sc. V Semester (BOTANY)
2025-26
DSE- 03 - Plant metabolism-LAB

Practical Scheme (1 Credit)

1.	Enzymology	10
2.	Extraction & estimation of proteins, carbohydrates & Fats	10
3.	Nitrogen fixation/plant growth regulators	10
4.	Spotting	10
5.	<i>Viva-voce</i>	05
6.	Sessional	05

Total Marks: 50

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B. Sc. – V Semester (BOTANY)

2025-26

Session: 2025-26	Program: B.Sc.
Semester: V	Subject: Botany
Course type: DSE 04	Course code:
Title of DSE- 04	Plant Diseases
Credits: 3	Lecture: 45
Maximum Marks: 100	Minimum Passing Marks: 40

Title	Plant Diseases
Course outcomes	<ul style="list-style-type: none">➤ This course aims to know the basic concepts of plant pathology.➤ To know the various diseases, pathogens and mode of action of plant disease.➤ Also known the plant disease control management.
Learning outcomes	<p>The students will be able to learnin:</p> <ul style="list-style-type: none">➤ They will be understand the basic concept of plant pathogenesis.➤ Learn about the various disease name and its causative pathogens.➤ Understand the basic concept of plant disease control management.

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B. Sc. V Semester (BOTANY)

2025-26

DSE – 04

UBSDET508

Title			Plant Diseases
Units	Lectures	Credits	Syllabus
I	10	3	Symptomatology, pathogenic and non-pathogenic symptoms caused by fungi, bacteria, virus, nematode, mycoplasma.
II	10		Diseases due to Fungi: Rust disease, Smut disease, Downy mildew, Leaf blight, Tikka disease.
III	15		Diseases due to Bacteria: Tundu disease, Citrus canker, Angular leaf spot, Crown gall of stone fruit. Diseases due to Nematodes: Root knot, Ear cockles of wheat. Diseases due to Mycoplasma: Sandal spike, Little leaf of Brinjal.
IV	10		Principles of plant disease control: Chemical control, Biological control, Plant Quarantine, Principles and methods of plant disease management.
Total	45 Lectures	3 Credits	

Evaluation Scheme for Theory

Exam Type	Marks
End Term Exam	80
Internal Exam	20

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B. Sc. V Semester (BOTANY)
2025-26
DSE Practical 04: Plant Diseases -LAB

Practical Scheme (1 Credit)

1.	Fungal diseases	10
2.	Bacterial diseases	10
3.	Mycoplasma/Nematode disease	10
4.	Spotting	10
5.	<i>Viva-voce</i>	05
6.	Sessional	05

Total Marks: 50

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B. Sc. – V Semester (BOTANY)

2025-26

Session: 2025-26	Program: B.Sc.
Semester: V	Subject: Botany
Course type: SEC – 03	Course code:
Title of SEC – 03	Biofertilizer and Biopesticides
Credits: 02 Credits	Lecture: 30 Lectures
Maximum Marks: 50	Minimum Passing Marks: 20

Title	Biofertilizer and Biopesticides
Course outcomes	<ul style="list-style-type: none">➤ This course aims to educate student about general account about the microbes used as biofertilizer.➤ Know about Mycorrhizal association and its application.➤ Know about the history and concept of biopesticides.
Learning outcomes	<ul style="list-style-type: none">➤ The student will enrich themselves with biofertilizer and its importance.➤ Understand the preparation of biofertilizer & agent used in biofertilizer like Cyanobacteria.➤ Learn about Mycorrhizal association and VAM.➤ Understand about the biopesticides and its production.

 

B. Sc. V Semester (BOTANY)

2025-26

SEC – 03

Title			Biofertilizer and Biopesticides
Units	Lectures	Credit	Syllabus
I	8	2	General account about the microbes used as biofertilizer. Biofertilizers: Introduction, status and scope. Structure and characteristic features of bacterial biofertilizers- <i>Azospirillum</i> , <i>Azotobacter</i> , <i>Bacillus</i> , <i>Pseudomonas</i> , <i>Rhizobium</i> and <i>Frankia</i> .
II	7		Cyanobacteria (Blue green algae), <i>Azolla</i> and <i>Anabaena</i> nitrogen fixation, factors affecting growth, blue green algae and <i>Azolla</i> in rice cultivation.
III	8		Mycorrhizal association, types of mycorrhizal association, colonization of VAM – isolation and inoculum production of VAM and its influence on growth and yield of crop plants.
IV	7		History and concept of biopesticides. Importance, scope and potential of biopesticide. Definitions, concepts and classification of biopesticides, Mass production technology of bio-pesticides. Virulence, pathogenicity and symptoms of entomopathogenic pathogens and nematodes. Uses of biopesticide.
Total	30 Lectures	2 Credit	

Evaluation Scheme for Theory

Exam Type	Marks
End Term Exam/Project	40
Internal Exam	10
Total marks	50

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