

**DEPARTMENT OF BOTANY**  
**COURSE CURRICULUM & MARKING SCHEME**

**B.Sc. Part - III**

**BOTANY**

**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<sup>+</sup>, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

Phone : 0788-2212030

Website - [www.govtsciencecollegedurg.ac.in](http://www.govtsciencecollegedurg.ac.in), Email – [autonomousdurg2013@gmail.com](mailto:autonomousdurg2013@gmail.com)

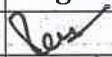



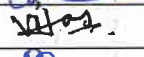







**GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE, DURG**  
**Syllabus and Marking Scheme for B.Sc. Part III**

**Session: 2023-2024**

Paper No.	Title of the Paper	Marks Allotted in Theory	
		Max	Min
Paper- I (Course Code- BBO05)	Analytical Technology Plant Pathology, Experimental Embryology, Elementary Biostatistics, Environmental Pollution, and Conservation	50	17
Paper- II (Course Code- BBO06)	Genetics, Molecular Biology, Biotechnology and Biochemistry	50	17
III	Lab Course/ Practical	50	17
	<b>Total</b>	<b>150</b>	

<b>02 Theory papers</b>	-	<b>100</b>
<b>01 Practical</b>	-	<b>50</b>
<b>Total Marks</b>	-	<b>150</b>

**Name and Signatures of Members Board of Studies**

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1.	Chairperson	<b>Dr. Ranjana Shrivastava</b>	
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	
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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.)	

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**B.Sc. – Part III**

**BOTANY**

**SESSION-2023-2024**

**PAPER-I (Course Code - BBO05)**

**ANALYTICAL TECHNOLOGY PLANT PATHOLOGY, EXPERIMENTAL  
EMBRYOLOGY, ELEMENTARY BIOSTATISTICS AND ENVIRONMENTAL  
POLLUTION AND CONSERVATION**

**M.M. 50**

**Min. 17**

**UNIT-I**

Structure, Principle and applications of analytical Instrumentation.

Chromatography techniques, Oven, Incubator, Centrifuge, Spectrophotometer

**UNIT-II**

Plant tissue culture techniques, growth media, totipotency, protoplast culture, somatic hybrids and cybrids, micropropagation, somaclonal variations, haploid culture.

Analytical techniques: Microscopy-Light microscope, Electron microscopes.

**UNIT-III**

General principles of plant pathology, general symptoms of fungal, bacterial, and viral diseases, mode of infection, disease resistance, and control measures, plant quarantine. A study of epidemiology and etiology of following plant diseases

Rust disease of wheat, Tikka disease of ground nut, Red rot of sugarcane, Bacterial blight of rice, Yellow vein mosaic of bhindi, Little leaf of brinjal.

**UNIT-IV**

Introduction to pollution, greenhouse gases, Ozone depletion, Dissolve oxygen, B.O.D., C.O.D.

Biomagnifications, Eutrophication, Acid precipitation, Phytoremediation. Plant indicators, Biogeographical Zones of India, Concept of Biodiversity, CBD, MAB, National parks and Biodiversity Hot Spots, Conservation strategies, Red Data Book, IUCN threat categories, invasive species, endemic species, concept of sustainable development.

## UNIT-V

Introduction and application of Biostatistics, measure of central tendency-Mean, Median, Mode, measures of dispersal-Standard deviation, standard error.

### Books Recommended:

Singh, RS, Plant Diseases, Oxford & IBH, New Delhi.

Pandey, BP, Plant Pathology, S. Chand Publishing, New Delhi.

Sharma, PD, Microbiology and Plant Pathology, Rastogi Publications, Meerut.

Sharma, PD, Mycology and Phytopathology, Rastogi Publications, Meerut.

Singh JS, Singh SP and Gupta, SR, Ecology Environmental Science and Conservation, S. Chand Publishing, New Delhi.

Sharma, PD Ecology and Environment, Rastogi Publications, Meerut.

Bhojwani, SS and Razdan, MK, Plant Tissue Culture: Theory and Practices. Elsevier.

Sharma AK, Text book of Biostatistics, Discovery Publishing House Pvt. Ltd.

### COURSE OUTCOME

- Understand the principle, application, and techniques of instruments.
- Know the culture methods and techniques.
- Learn about Analytical techniques.
- Understand about the various plant diseases, managements, and controls.
- Learn the symptoms of plant diseases.
- Understand about causes and effect of environmental pollution.
- Know about reason of Global warming, and Ozone hole.
- Learn about the Conservation strategies.
- Understand sustainable development.
- Understand the Biodiversity.
- Know about the Biostatistics.

### Question Paper Format and Distribution of Marks for Under Graduate Examination




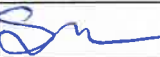
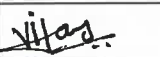







1. There shall be three sections (Section A, B, and C) in each theory paper.
2. Section A shall contain very short answer type questions (One or two line answer) or objective type questions (fill in the blank). **(not multiple choice questions)**
3. Section B shall contain short answer type questions 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 students are required to study the content mentioned in the curriculum exhaustively.

**EVALUATION PATTERN**

- Theory 50 marks
- Practical 50 marks

Question Type	MM 50 (Marks X No. of Q.)
A (Very short Ans.)	1X10 = 10
B (Short Ans.)	3X5 = 15
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**B.Sc. Part-III**

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**SESSION: 2023-2024**

**PAPER-II (Course Code - BBO06)**

**GENETICS, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY**

**M.M. 50**

**Min. 17**

**UNIT-I**

Cell and cell organelles, organization and morphology of chromosomes, giant chromosomes, cell division, Mendel's laws, gene interactions, linkage and crossing over, chromosomal aberration, polyploidy, sex linked inheritance, sex determination, cytoplasmic inheritance, gene concept: cistron, muton, recon.

**UNIT-II**

Nucleic acids, structure and forms of DNA and RNA, DNA/RNA as genetic material, replication of DNA, biochemical and molecular basis of mutation, genetic code and its properties, mechanism of transcription and translation in prokaryotes, regulation of gene expression, Operon model.

**UNIT-III**

Recombinant DNA, Enzymes in recombinant DNA technology, cloning vectors (Plasmid, Bacteriophages, Cosmids, Phagemids), gene cloning, PCR, Application of Biotechnology; G.M. plants, Monoclonal antibodies, DNA finger printing.

**UNIT-IV**

Protein: Chemical composition, primary, secondary and tertiary structure of Proteins.

Carbohydrate: general account of monosaccharide's, disaccharides, and polysaccharides.

Fat: Structure and properties of fats and fatty acids, synthesis and breakdown.

**UNIT-V**

Enzymes: Nomenclature and classification, components of enzyme, theories of enzyme action, enzyme kinetics (Michaelis-Menten constant), allosteric enzymes, isozymes, Abzymes, Ribozymes, factors affecting enzyme activity.

### **Books Recommended:**

Nelson, DL, Cox, MM, Lehninger Principles of Biochemistry, W.H. Freeman and Company, New York, USA.

Cooper, GM, The Cell: A Molecular Approach, ASM Press & Sunderland, Washington, D.C. Sinauer Associates, MA.

Singh, BD, Fundamental of Genetics, Kalyani Publications.

Singh, BD, Genetics, Kalyani Publications.

Gupta, PK, Cell and Molecular Biology, Rastogi Publications, Meerut.

Singh, BD, Biotechnology: Expanding Horizons, Kalyani Publications.

Gupta, PK, Elements of Plant Biotechnology, Rastogi Publications, Meerut.

Gupta, SN, Concepts of Biochemistry, Rastogi Publications, Meerut.

Jain, JL, Jain, S and Jain, N, Fundamentals of Biochemistry, S Chand Publishing, New Delhi

### **Suggested Laboratory Exercises**

1. To study of host parasite relationship of plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques.

### **COURSE OUTCOME**

- Know the structure and components of cell.
- Understands about genetics and Mendel's laws.
- Know the gene concept.
- Understand about molecules, genetic material.
- Know the regulation and expression of gene.
- Understand about recombinant technology.
- Study the various vectors used in recombinant technology.
- Know the application of Biotechnology.
- Understand about biomolecules (Proteins, Fats, carbohydrates).
- Study the enzyme and enzymes concept.
- Know the various enzymes.

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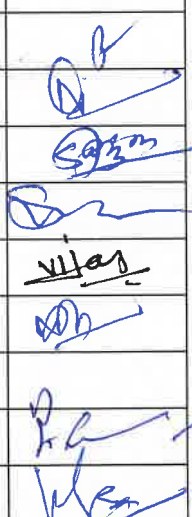

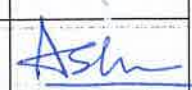

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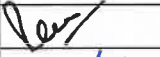
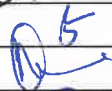
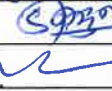


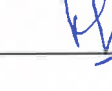


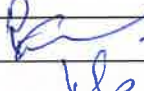
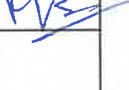

PRACTICAL SCHEME

Time: 4 Hrs.

Marks: 50

01.	Plant Disease/Symptoms	10
02	Instrumentation techniques	05
03	Staining of Microbes	05
04	Tissue Culture Techniques	05
05	Spotting (1-5 spots)	10
06.	Project Work/ Field Study	05
07	Viva Voce	05
08.	Sessional	05

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