



**Pt. Ravishankar Shukla University**  
**Raipur 492 010, Chhattisgarh**

## **Syllabus**

**Entrance Test**  
**for**  
**Ph.D. in Botany**

**Session**  
**2025-2026**

### **Approved by**

Board of Studies : Biotechnology  
 Date : 21/05/2025  
 Name of Chairman : Prof. Keshav Kant Sahu  
 Name of Members : Prof. Ajay Kumar  
 : Dr. Sayal Sayu Deo  
 : Dr. Bharti Sahu  
 : Dr. Nagesh K. Choudhary, Ankita Rathi, KHEMRA

BoS Approved Syllabus for Ph.D. Entrance Test in Botany  
 (Academic Session 2025-26)

Keshav  
 21/5/25

BSahu  
 21/5/25

Ankita  
 21/5/25

Ch  
 21/05/25

Sayal  
 21/5/2025  
 Khemra  
 21-5-25

## Syllabus of Botany

### For Ph.D. Entrance Exam Session: 2024-2025

#### 1. Microbiology and Plant Pathology

Structure and multiplication of viruses, various bacteria, fungi, mycoplasma & Phytoplasma, Applications of microbiology in agriculture, industry, medicine and in control of soil water pollution. Important crop diseases caused by viruses bacteria, mycoplasma, fungi and nematodes, modes of infection and dissemination, Molecular basis of infection and disease resistance/defense Physiology of parasitism and control measures; Fungal toxins, Modeling and disease forecasting; Plant quarantine seed pathology.

#### 2. Cryptogams:

Algae, Fungi, lichens, Bryophytes, Pteridophytes Structure and reproduction from evolutionary viewpoint, distribution of cryptogams in India and their ecological and economic importance.

#### 3. Phanerogams:

Gymnosperms concept of Progymnosperms, Classification and distribution of gymnosperms, Geological time scale Types of fossils and their study techniques.

Angiosperms:

Systematic, anatomy, embryology, Palynology, Methods of taxonomy of plants, animals and micro-organisms. Numerical taxonomy and Chemo taxonomy.

#### 4. Diversity of life forms:

Structural organization: unicellular, colonial and multi cellular forms, levels of organization of tissues organs & systems, comparative anatomy. Stomata and their types, Glandular & non glandular trichomes, secondary growth, wood anatomy.

#### 5. Developmental Biology:

Basic concept of development, Gametogenesis fertilization and early development, Morphogenesis and organogenesis in plants. Programmed cell death, aging and senescence. (Development of male and female gametophyte, pollination, fertilization, Embryo development, Polyembryony and apomixes, Palynology experimental embryology including pollen storage and test tube fertilization).

Morphogenesis:

Totipotency, polarity, symmetry and differentiation Protoplast culture, somatic hybrids, Micro-propagation somaclonal Variation: Pollen haploids, embryo rescue.

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**6. Plant resource development:**

Domestication and introduction of plants, origin and cultivated plants, Plants as sources for food, fiber fodder, spices, beverage, edible oils, drugs, narcotics insecticides, timber, gums, resins and dyes, latex cellulose, Starch, perfumery, Importance of Ethnobotany Botanical gardens and Herbarium.

**7. Inheritance Biology:**

Mendelian principles, Gene mapping methods Microbial genetics

**8. Ecological Principles:**

The environment Physical & biotic environment biotic and abiotic interactions, Community ecology Ecosystem - structure & function, mineral cycling (CNP), Primary production and decomposition, structure and function of some Indian ecosystems. Applied ecology Environmental pollution global environmental change, biodiversity status, monitoring and documentation, major drivers of biodiversity change, management approaches. Microbiology of atmosphere.

**9. Applied Biology:**

Microbial fermentation and production of small and macro molecules. Application of immunological principles, tissue and cell culture methods for plants, transgenic plants, molecular approaches to diagnosis and strain identification, Bioresources and uses of biodiversity. Plant and human welfare. Role of Plants in human life, importance of plants.

*Seyal*

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*Bealu*

*Ankita*

*Khushi*

*Arshu*