

# Department of Botany

## GOVT. SHRIMANT MADHAVRAO SCINDIA P.G. COLLEGE SHIVPURI (M.P.)

### M.sc Ist Sem Botany

#### Paper 1<sup>st</sup> – Bacteriology, virology and general microbiology

C.O.I	Study of microbes such as Virus, bacteria, fungi mycoplasma and other prokaryotes is very useful for general knowledge of students.
C.O.II	To learn about sterilization and culture media.
C.O.III	To Study about viruses and viral diseases
C.O.IV	To study about biological nitrogen fixation and fermentation technology.
C.O.V	to learn about immunity and allergy.

#### Paper 2<sup>nd</sup> – Biology and diversity Fungi plant pathology.

C.O.I	To study about the diversity and classification of fungi.
C.O.II	To learn about comparative study of subdivision of fungi.
C.O.III	To study about mushroom cultivation and fungal cytology.
C.O.IV	Learn about sytology in fungal, bacterial and viral infection of plants.
C.O.V	To learn about role of enzymes and toxins in pathogenesis.

#### Paper 3<sup>rd</sup> – Biology and diversity of algae, bryophytes and lichens.

C.O.I	To learn about diagnostic features and classification of algae.
C.O.II	To learn about comparative account of algal divisions
C.O.III	To study about distribution of algae.
C.O.IV	To study about origin of bryophytes and its classification
C.O.V	To learn about bryogeographical region of India and general account of lichens.

#### Paper 4<sup>th</sup> – Biology and diversity of pteridophytes and gymnosperms.

C.O.I	To study about evolution and classification of pteridophytes
C.O.II	Learn about comparative study of different orders of pteridophytes.
C.O.III	To study that pteridophytic life cycle and recent classification of gymnosperms.
C.O.IV	Learn about fossil gymnosperms and morphology and anatomy of different order of gymnosperms.
C.O.V	To Study about structure and evolution of archegonium in bryophyte, pteridophytes and gymnosperms.

### M.sc IInd Sem Botany

#### Paper 1<sup>st</sup> – Ecology -1 climatology, soil science and autoecology.

C.O.I	To study about scope and concept of plant ecology .
C.O.II	To learn about ecological factors.
C.O.III	To learn about origin development and classification of soil.
C.O.IV	To study about population ecology.
C.O.V	To learn about plant indicators and gene ecology.

#### Paper 2<sup>nd</sup> – Angiosperm anatomy, embryology and palynology.

C.O.I	To learn about origin, growth, differentiation of cells ontogeny and phylogeny of xylem and phloem.
C.O.II	To study about nodal anatomy.
C.O.III	To learn about microsporogenesis and megasporogenesis.
C.O.IV	To learn about embryology and taxonomy of angiosperms.
C.O.V	To learn about palynology and aerobiology .

### **Paper 3<sup>rd</sup> – Water relations, Growth and development.**

C.O.I	To study about water relations of plants.
C.O.II	To learn about photosynthesis.
C.O.III	To study about photo respiration and water stress and tolerance mechanism.
C.O.IV	To learn about enzymes.
C.O.V	To study about morphogenesis and plant hormones.

### **Paper 4<sup>th</sup> – plant Biochemistry and Metabolism**

C.O.I	To study about carbohydrates and proteins.
C.O.II	To learn about the lipids and ATP.
C.O.III	To study about biosynthesis and degradation of fatty acids.
C.O.IV	To learn about nitrogen fixation
C.O.V	To study about important phenolics and alkaloids of plants.

## **M.sc IIIrd Sem Botany**

### **Paper 1<sup>st</sup> – Angiosperm, Morphology and Taxonomy**

C.O.I	To learn about floral morphology.
C.O.II	Learn about stamens and carpels.
C.O.III	To learn about role of floral anatomy and experimental study of flower.
C.O.IV	To learn about important classification of angiosperm.
C.O.V	To study about botanical nomenclature and different categories of threats.

### **Paper 2<sup>nd</sup> – Cytology and Molecular Biology of plants**

C.O.I	To study about plant cells and its organelles
C.O.II	Study about chromosome structure and its organisation.
C.O.III	To learn about DNA and its replication and packaging, transcription and translation.
C.O.IV	To learn about meiosis and mitosis division.
C.O.V	To study about transposable elements and membrane structure.

### **Paper 3<sup>rd</sup> – Biometry Bioinformatics and Instrumentation**

C.O.I	To gain knowledge about chi square test ANOVA and application of probability
C.O.II	Study the test of significance growth curve and principle of experimental design
C.O.III	To learn about chromatography electrophoresis and centrifugation
C.O.IV	To learn about microscopy and spectrophotometry
C.O.V	To gain knowledge about information technology and science.

### **Paper 4<sup>th</sup> – Ecology II Synecology, Ecosystematology and Phytogeography**

C.O.I	To learn about plant community.
C.O.II	Gain knowledge about plant succession and energy flow
C.O.III	To study about agro ecosystem and biogeochemical cycle
C.O.IV	Study about vegetation type of India and productivity of various ecosystem
C.O.V	Learn about phytogeography

## **M.sc IVth Sem Botany**

### **Paper 1<sup>st</sup> – Genetics Plant Breeding and Evolution**

C.O.I	To study about genetics
C.O.II	To gain knowledge of linkage and crossing over
C.O.III	To learn about genetic recombination and mutation
C.O.IV	Gain knowledge of origin of life
C.O.V	To study about plant breeding

### **Paper 2<sup>nd</sup> – Plant Biotechnology in Vitro Culture Genetic Engineering and IPR Issue**

C.O.I	To study about concept and scope of biotechnology.
C.O.II	To study about micropropagation and protoplast culture

C.O.III	To learn about biotransformation
C.O.IV	To study about restriction enzymes and clone and different blotting techniques
C.O.V	To learn about application of DNA technology

### **Paper 3<sup>rd</sup> – Ethnobotany and Isolation of Natural Products**

C.O.I	To study about the scope of ethnobotany and Indian work on ethnobotany
C.O.II	To learn about wild edible plant used by ethnic peoples
C.O.III	To know about ethnobotanical and its ethnomedicinal plants in the area
C.O.IV	To learn about plant used in medicines
C.O.V	To study about plant used in scarcity emergency and supplementary foods

### **Paper 4<sup>th</sup> – Plant Pathology and Microtoxicology**

C.O.I	To study about history and principle of plant pathology
C.O.II	To learn about the physiological and molecular plant pathology
C.O.III	To study about management of plant diseases
C.O.IV	To learn about mycotoxin
C.O.V	To study about phytopathogenic toxins.

## **B.sc Ist Year Botany**

### **Paper 1<sup>st</sup> – Diversity of lower Plants**

C.O.I	To study the cryptogams and detail learning about their diversity
C.O.II	To study the whole classification and morphology about algae fungi bryophytes and pteridophytes
C.O.III	Study the life cycle of cryptogams
C.O.IV	Study the economic importance of cryptogams
C.O.V	Basic knowledge about virus, bacteria cyanobacteria and to study application of microbiology.

### **Paper 2<sup>nd</sup> – Diversity of Higher Plants**

C.O.I	To study the distribution classification and general characters of gymnosperm in India
C.O.II	Study about the structure reproduction and life cycle of gymnosperms like cycas, pinus and ephedra
C.O.III	Learn about root apical meristem internal structure root modification of monocot and dicot plants
C.O.IV	To study the shoot systems of monocot and dicot plants
C.O.V	Learn about the internal leaf structure of dicot and monocot plants, study the photosynthesis and water stress physiology of plants

## **B.sc IInd Year Botany**

### **Paper 1<sup>st</sup> – Taxonomy and Embryology of Angiosperms**

C.O.I	Learn about the origin and evolution of angiosperm
C.O.II	Study about economical importance of different flowering plants
C.O.III	Learn about different families.
C.O.IV	Study the structure of anther, microsporogenesis and male and female gametophyte
C.O.V	Teach about double fertilization triple fusion and development of fruits

### **Paper 2<sup>nd</sup> – Plant Ecology, Biodiversity and phytogeography**

C.O.I	To study the structure of ecosystem ecological pyramids and energy flow in ecosystem
C.O.II	Learn about ecological adaptation plant succession process
C.O.III	To study the features of any population like density, natality mortality growth curve learn about biodiversity
C.O.IV	Learn about physical and chemical properties of soil, acid rain global warming etc
C.O.V	Study about phytogeography of India and Madhya Pradesh

# B.sc IIIrd Year Botany

## Paper 1<sup>st</sup> – Plant Physiology and Biochemistry

C.O.I	Study about plant water relation
C.O.II	To learn the plant nutrition (macro and micro) biomolecules (carbohydrates lipids protein enzyme) and metabolism process
C.O.III	Learn about photosynthesis process occur in plants
C.O.IV	To study the respiration process in plants
C.O.V	To know about enzyme and plant hormones

## Paper 2<sup>nd</sup> – Cell Biology, Genetics and Biotechnology

C.O.I	Learn about structure of plasma membrane cell wall and different cell organelles
C.O.II	To study the chromosomal organisation of plant also study about DNA replication
C.O.III	Detail study about mendalian laws
C.O.IV	To learn about gene, different types of RNA and role of RNA in evolution
C.O.V	To study the plant breeding techniques biotechnology and genetic engineering