

COURSE TEAM

M.Sc.

BOTANY

COURSE - I

**BIOLOGY & DIVERSITY OF
VIRUSES, BACTERIA AND FUNGI**



CONTENTS

Page No.

BLOCK - I : VIRUSES

Unit - 1	: General Characters and Classification of Viruses	3
Unit - 2	: Chemistry and Ultrastructure of Viruses	15
Unit - 3	: Isolation and Purification of Viruses	23
Unit - 4	: Replication and Transmission of Viruses	29
Unit - 5	: General Account of Plant, Animal and Human Viral Diseases	38

BLOCK - II : BACTERIA

Unit - 6	: General Account and Classification of Eubacteria, Archaeobacteria and Cyanobacteria	57
Unit - 7	: Ultra Structure, Nutrition and Reproduction of Bacteria	75
Unit - 8	: Economic Importance of Bacteria	92
Unit - 9	: Mycoplasma	112

BLOCK - III : FUNGI - I

Unit - 10	: General Characters and Classification of Fungi	125
Unit - 11	: Ultra Structure of Cell and Cell Wall Composition	145
Unit - 12	: Nutrition in Fungi	155
Unit - 13	: Reproduction in Fungi	164
Unit - 14	: Hetrothallism, Hetrokaryosis and Parasexuality	191

BLOCK - IV : FUNGI - II

Unit - 15	: Mastigomycotina and Zygomycotina	203
Unit - 16	: Ascomycotina, Basidiomycotina and Deuteromycotina	218
Unit - 17	: Fungi in Industry	250
Unit - 18	: Fungi in Agriculture and Forestry	261
Unit - 19	: Fungi as Human and Animal Parasites (Medical Mycology)	287
Unit - 20	: Fungi as Food	306

M.Sc.
BOTANY

COURSE – II
**BIOLOGY & DIVERSITY OF ALGAE,
BRYOPHYTA AND PTERIDOPHYTA**



H

CONTENTS

Page No.

BLOCK - I : ALGAE - I

Unit - 1	: General Characters and Classification	3
Unit - 2	: Thallus Organisation in Algae	23
Unit - 3	: Reproduction and Life Cycles of Algae	34
Unit - 4	: Life Histories of Some Genera of Chlorophyta - I	53
Unit - 5	: Life Histories of Some Genera of Chlorophyta - II	72

BLOCK - II : ALGAE - II

Unit - 6	: General Characters of Cyanophyta	93
Unit - 7	: General Characters of Some Genera of Xanthophyta and Bacillariophyta	104
Unit - 8	: General Characters and Life Histories of Some Members of Phaeophyta	125
Unit - 9	: General Characters and Life Histories of Rhodophyta	137
Unit - 10	: Economic Importance of Algae	146

BLOCK - III : BRYOPHYTA

Unit - 11	: General Characters, Classification, Distribution and Economic Importance of Bryophytes	157
Unit - 12	: Marchantiales (<i>Marchantia</i>) and Jungermanniales (<i>Pellia</i>)	162
Unit - 13	: Anthoceratales (<i>Anthoceros</i>) and Sphagnales (<i>Sphagnum</i>)	182
Unit - 14	: The Evolution of Gametophyte	203
Unit - 15	: Evolution of Sporophyte	210

BLOCK - IV : PTERIDOPHYTA

Unit - 16	: General Characters and Classification of Pteridophytes	217
Unit - 17	: Structure and Life Histories of <i>Psilotum</i> , <i>Lycopodium</i> , <i>Selaginella</i> and <i>Equisetum</i>	226
Unit - 18	: Telome Theory and Stelar Evolution	257
Unit - 19	: Heterospory and Seed Habit	269
Unit - 20	: Fossil Pteridophytes (<i>Rhynia</i> , <i>Psilophyton</i> and <i>Calamites</i>)	275

M.Sc.

BOTANY

COURSE - III

GYMNOSPERMS, TAXONOMY OF
ANGIOSPERMS AND ANATOMY



CONTENTS

Page No.

BLOCK - I : GYMNOSPERMS

- Unit - 1 : Distribution, General Characteristics, Classification and Economic Importance of Gymnosperms 3
- Unit - 2 : Morphology and Anatomy of Cycadales, Ginkgoales, Coniferales, Taxales and Gnetales 31
- Unit - 3 : Reproductive Structure of Cycadales, Ginkgoales, Coniferales, Taxales and Gnetales 57
- Unit - 4 : Development of Male and Female Gametophytes 78
- Unit - 5 : Fossil Gymnosperms 110

BLOCK - II : TAXONOMY OF ANGIOSPERMS - I

- Unit - 6 : Origin and Phylogeny of Angiosperms 137
- Unit - 7 : International Code of Botanical Nomenclature 147
- Unit - 8 : Systems of Classification 158
- Unit - 9 : Recent Trends in Plant Taxonomy 215
- Unit - 10 : Biosystematics 254

BLOCK - III : TAXONOMY OF ANGIOSPERMS - II

- Unit - 11 : General Account of Ranales, Centrospermales and Amentiferae 271
- Unit - 12 : General Account of Tubiflorae, Helobiales and Poales 289
- Unit - 13 : Flora and Vegetation of Andhra Pradesh 302
- Unit - 14 : Herbarium Methodology and Herbaria 315
- Unit - 15 : Biodiversity and Conservation 332

BLOCK - IV : ANATOMY

- Unit - 16 : Apical Meristems of Root and Shoot 349
- Unit - 17 : Tissues & Tissue Systems 369
- Unit - 18 : Primary Structure of Root Stem and Leaf 405
- Unit - 19 : Secondary Growth 439
- Unit - 20 : Wood Anatomy 470

M.Sc.

BOTANY

COURSE – IV

BIOCHEMISTRY AND PLANT
PHYSIOLOGY



CONTENTS

Page No.

BLOCK - I : BIOCHEMISTRY - I

Unit - 1 : Principles of Thermodynamics	3
Unit - 2 : Enzymes	11
Unit - 3 : Carbohydrates	31
Unit - 4 : Lipids	46

BLOCK - II : BIOCHEMISTRY - II

Unit - 5 : Amino Acids	61
Unit - 6 : Proteins	77
Unit - 7 : Nucleic Acids	86
Unit - 8 : Structure and Function of Membranes	97

BLOCK - III : PLANT PHYSIOLOGY - I

Unit - 9 : Plant Water Relations	111
Unit - 10 : Mineral Nutrition	124
Unit - 11 : Photosynthesis - I	164
Unit - 12 : Photosynthesis - II	186

BLOCK - IV : PLANT PHYSIOLOGY - II

Unit - 13 : Respiration - I	207
Unit - 14 : Respiration - II	220
Unit - 15 : Nitrogen and Sulphur Metabolism	238
Unit - 16 : Plant Growth Regulators	268

BLOCK - V : PLANT PHYSIOLOGY - III

Unit - 17 : Mechanism of Hormonal Regulation of Plant Growth and Development	289
Unit - 18 : Physiology of Flowering and Vernalisation	295
Unit - 19 : Seed Dormancy and Germination	304
Unit - 20 : Stress Physiology	319

M.Sc.

BOTANY

COURSE V

CELL BIOLOGY, GENETICS, BIostatISTICS
AND
ECOLOGY



CONTENTS

	Page No
BLOCK - I CELL BIOLOGY,	
Unit - 1 Principles and Application of Light, Phase Contrast, Fluorescence and Electron Microscopy	3
Unit - 2 Ultra Structure and Function of Plant Cell and Organelles	13
Unit - 3 Chromosome	46
Unit - 4 Special Types of Chromosome	59
Unit - 5 Cell Cycle and Apoptosis	66
BLOCK - II GENETICS,	
Unit - 6 DNA	83
Unit - 7 Genetic Code	95
Unit - 8 Brief Overview of Mendelian Inheritance	106
Unit - 9 Chromosomal Aberrations	122
Unit - 10 Mutations	134
BLOCK - III BIOSTATISTICS	
Unit - 11 Mean Variance	171
Unit - 12 Application of Computers in Biology	195
BLOCK - IV PLANT ECOLOGY - I	
Unit - 13 Principles, Concepts and Levels of Ecology	212
Unit - 14 Community Characteristics	227
Unit - 15 Biodiversity	236
Unit - 16 Ecosystem	253
BLOCK - V PLANT ECOLOGY - II	
Unit - 17 Global Biogeochemical Cycles of C, N ₂ , P and S	270
Unit - 18 Climate, Soil, Vegetation Pattern of India	284
Unit - 19 Climate Change and Green House Gases	310
Unit - 20 Environmental Pollution	316

M.Sc.

BOTANY

COURSE VI

MEDICINAL PLANTS AND EMBRYOLOGY OF ANGIOSPERMS



CONTENTS

BLOCK - I MEDICINAL PLANTS - I

Unit - 1	Role of Plants in Medicine, Origin and Development and Different Systems of Medicine,	3
Unit - 2	General Account of Phytochemistry of Medicinal Plants	20
Unit - 3	Morphology, Active Principles and Medicinal Value-I	34
Unit - 4	Morphology, Active Principles and Medicinal Value-II	45

BLOCK-II MEDICINAL PLANTS - II

Unit - 5	Cultivation of Medicinal Plants	57
Unit - 6	Pharmacognosy and Adulteration of Plant Drugs	69
Unit - 7	Ethnobotany - History, Scope and Importance	80
Unit - 8	Conservation of Medicinal Plants	96

BLOCK-III EMBRYOLOGY OF ANGIOSPERMS - I

Unit - 9	Structure of Anther and Development of Male Gametophyte	109
Unit - 10	Structure of Ovule and Development of Female Gametophyte	126
Unit - 11	Fertilization	171
Unit - 12	Sexual Incompatibility	183

BLOCK-IV EMBRYOLOGY OF ANGIOSPERMS-II

Unit - 13	Development of Endosperm	198
Unit - 14	Development of Embryo	220
Unit - 15	Apomixis	231
Unit - 16	Polyembryony	243

BLOCK-V EMBRYOLOGY OF ANGIOSPERMS-III

Unit - 17	Parthenocarpy	259
Unit - 18	Experimental Embryology	270
Unit - 19	Applications of Embryology in Taxonomy, Agriculture and Horticulture	286
Unit - 20	Principles and Applications of Palynology	309

M.Sc.

BOTANY

COURSE VII

**APPLIED MYCOLOGY
AND
PLANT PATHOLOGY**



CONTENTS

BLOCK -I DIVERSITY, TAXONOMY AND UTILIZATION OF FUNGI

- Unit - 1 General Account and Diversity of Fungi
- Unit - 2 Fungal Taxonomy
- Unit - 3 Mycorrhizae
- Unit - 4 Edible Mushrooms: Medicinal and Nutritional Value
- Unit - 5 Mushroom Cultivation
- Unit - 6 Fungi as Biopesticides

BLOCK-II FUNGAL BIOTECHNOLOGY

- Unit - 7 Scope and Techniques of Fungal Biotechnology
- Unit - 8 Fungal Enzymes and Metabolites
- Unit - 9 Industrial production of Penicillin, Citric Acid and Alcohol
- Unit - 10 Fungi in Relation to Pollution
- Unit - 11 Fungi in Biodegradation

BLOCK -III PRINCIPLES OF PLANT PATHOLOGY

- Unit - 12 History and Concepts of Plant Pathology
- Unit - 13 Classification and Symptomatology of Fungal, Bacterial, Viral, Phytoplasmal and Nematode Diseases
- Unit - 14 Host - Pathogen Interaction - I
- Unit - 15 Host - Pathogen Interaction - II
- Unit - 16 Control of Plant Diseases

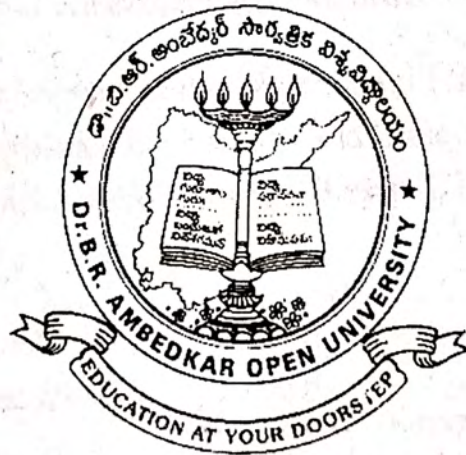
BLOCK-IV DISEASES CAUSED BY BACTERIAL, VIRUSES, PHYTOPLASMA AND SPIROPLASMAS

- Unit - 17 Plant Diseases Caused by Bacteria, Viruses, Phytoplasma and Spiro plasmas
- Unit - 18 Plant diseases of Cereals, Pulses and Oil Seeds
- Unit - 19 Plants Diseases of Fruits and Vegetables
- Unit - 20 Plant diseases of Cash Crops and Plantation crops

M.Sc.
BOTANY

COURSE VIII

**PLANT MOLECULAR BIOLOGY
AND
BIOTECHNOLOGY**



CONTENTS

BLOCK - I Molecular Biology-I

Unit - 1, Genome

Unit - 2, Genome Organization in Higher Plants

Unit - 3, Chloroplast and Mitochondrial Genomes

Unit - 4, Structure and Organization of Eukaryotic Genes

Unit - 5, Gene Expressions in Eukaryotes

Unit - 6, Regulation of Gene Expression in Eukaryotes

BLOCK-II Molecular Biology -II

Unit - 7, Restriction Endonucleases

Unit - 8, Modifying Enzymes Used in Molecular Cloning

Unit - 9, Cloning Vectors

Unit - 10, Genomic and cDNA Libraries

Unit - 11, Polymerase Chain Reaction

Unit - 12, Molecular Markers

BLOCK -III Biotechnology - I

Unit - 13, Introduction to Plant Tissue Culture and *in vitro* Morphogenesis,

Unit - 14, Anther, Pollen and Ovule Culture

Unit - 15, Cryopreservation of Plant Cells and Tissues and Germplasm storage

Unit - 16, Protoplast Culture and Somatic Hybridization

BLOCK-IV Biotechnology - II

Unit - 17, Transgenic Plants

Unit - 18, Plant Genomics and Proteomics

Unit - 19, Plants Metabolomics

Unit - 20, Intellectual Property Rights and Bio-safety.
