

**K.T.S.P. MANDAL'S**  
**SAHEBRAOJI BUTTEPATIL MAHAVIDYALAYA, RAJGUKUNAGAR**  
**DEPARTMENT OF MICROBIOLOGY**

**Teaching Plan (A.Y. 2024-25)**

**Course Code - SEMESTER IV**

**S.Y.B.Sc. Botany CBCS Pattern (Semester IV, Paper I) 2020-2021**

**BO 241: Plant Anatomy and Embryology**

Sr. No	Month	Topics	Teacher
1.	July	<b>Credit-I Plant anatomy:</b> <b>1. Introduction</b> 1.1 Definition 1.2 Scope of plant anatomy <b>2. Epidermal tissue system</b> 2.1 Structure, types and functions of epidermis 2.2 Structure, types and functions of Stomata 2.3 Epidermal outgrowths- non-glandular and glandular 2.4 Motor cells <b>3. Mechanical tissue system</b> 3.1 Principles involved in distribution of mechanical tissues with one example each a) Inflexibility, b) Incompressibility, c) Inextensibility and d) Shearing stress 3.2 Vascular tissue system: Structure and function of xylem, phloem and cambium	JRK
2.	August	<b>4. Normal secondary growth</b> 4.1 Introduction 4.2 Normal secondary growth in dicotyledonous stem 4.3 Development of annual rings, periderm, bark, tyloses and lenticel <b>5. Anomalous secondary growth</b> 5.1 Introduction 5.2 Causes of anomalous secondary growth 5.3 Anomalous secondary growth in: a) Dicotyledonous stem (Bignonia), b) Dicotyledonous root (Raphanus), c) Monocotyledonous stem (Dracaena)	JRK
3.	September	<b>Credit II- Plant Embryology</b>	JRK

		<p><b>7. Introduction</b></p> <p>7.1 Definition and scope of plant embryology</p> <p><b>8. Microsporangium and male gametophyte</b></p> <p>8.1 Structure of tetrasporangiate anther</p> <p>8.2 Types of tapetum 8.3 Sporogenous tissue</p> <p>8.4 Microsporogenesis: process and its types</p> <p>8.5 Types of microspore tetrad</p> <p>8.6 Male gametophyte: structure and development of male gametophyte</p>	
4.	October	<p><b>9 Megasporangium and female gametophyte</b></p> <p>9.1 Structure</p> <p>9.2 Types of ovules</p> <p>9.3 Types of megaspore tetrads</p> <p>9.4 Female gametophyte: structure of typical embryo sac</p> <p>9.5 Types of embryo sacs – monosporic, bisporic and tetrasporic</p> <p><b>10. Pollination and Fertilization:</b></p> <p>10.1 Introduction and definition</p> <p>10.2 Types of pollination</p> <p>10.3 Germination of pollen grain</p> <p>10.4 Entry of pollen tube- porogamy, mesogamy and chalazogamy</p> <p>10.5 Double fertilization and its significance.</p> <p><b>11. Endosperm and embryo</b></p> <p>11.1 Endosperm: Types – nuclear, helobial and cellular.</p> <p>11.2 Structure of Dicotyledonous and Monocotyledonous embryo.</p>	JRK



Teacher Incharge

Prof. J.R.Kote

**Head**

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**Course Code - SEMESTER IV**  
**S.Y .B.Sc. Botany CBCS Pattern (Semester IV, Paper I) 2020-2021**  
**BO 242: Plant Biotechnology**

Sr. No	Month	Topics	Teacher
1.	January	Credit I: Chapter 1 Introduction to Plant Biotechnology 1.1 History and definition 1.2 Scope and importance of plant biotechnology 1.3 Current status of biotechnology in India. Chapter 2 Plant Tissue Culture 2 .1 Concept of plant tissue culture and cellular totipotency 2.2 Basic techniques: Types of culture, Media preparation, sterilization, inoculation, incubation, hardening 2.3 Applications with reference to: Micropropagation, Somaclonal variation, Haploid production, Protoplast fusion & Somatic hybrids, Embryo rescue, Production of secondary metabolites. 2.4 Commercial Plant Tissue culture laboratories in Maharashtra and India.	JRK
2.	February	Chapter 3 Single Cell Protein (SCP) 3.1 Concept and definition 3.2 Importance of proteins in diet 3.3 Production of SCP from Spirulina and Yeast 3.4 Importance & acceptability of SCP Credit II: Chapter 4 Plant Genetic Engineering 4.1 Introduction, concept 4.2 Tools of genetic engineering (restriction enzymes, ligases, plasmid vectors) 4.3 Gene cloning Technique 4.4 Applications of plant genetic engineering: insect pest resistance, abiotic stress tolerance, herbicide resistance	JRK
3.	March	Chapter 5 Genomics, Proteomics and Bioinformatics 5.1 Genomics- concept, types, methods used for whole genome sequencing 5.2 Proteomics-concept, types, methods used in proteome analysis	JRK

		5.3 Bioinformatics-concept, database and its classification, data retrieval tools.	
4.	April	.Chapter 6 Bioremediation 6.1 Introduction and concept 6.2 Microbial remediation 6.3 Phytoremediation Chapter 7 Biofuel technology 7.1 Definition, Concept and types of Renewable and nonrenewable energy sources 7.2 Definition and concept of Biogas, Bioethanol, Biobutanol, Biodiesel & Biohydrogen	JRK



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