Teaching Plan

S.Y.B.Sc. Botany CBCS Pattern

(Semester IV, Paper I) 2020-2021

BO 241: Plant Anatomy and Embryology- 2 Credits (30 Lectures)

Sr. No.	Month	Topic
1	May 4th week	Credit-I Plant anatomy: (15 Lectures) 1. Introduction 1.1 Definition 1.2 Scope of plant anatomy 2. Epidermal tissue system 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
2	June 1st -2nd week	3. Mechanical tissue system 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 4. Normal secondary growth 4.1 Introduction 4.2 Normal secondary growth in dicotyledonous stem 4.3 Development of annual rings, periderm, bark, tyloses and lenticel 5. Anomalous secondary growth 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) **Credit-II Plant Embryology (15 Lectures)** 7. Introduction 7.1 Definition and scope of plant embryology 8. Microsporangium and male gametophyte
4	June 3rd- 4th week	8.1 Structure of tetrasporangiate anther 8.2 Types of tapetum 8.3 Sporogenous tissue 8.4 Microsporogenesis: process and its types 8.5 Types of microspore tetrad 8.6 Male gametophyte: structure and development of male gametophyte 9 Megasporangium and female gametophyte 9.1 Structure 9.2 Types of ovules 9.3 Types of megaspore tetrads 9.4 Female gametophyte: structure of typical embryo sac 9.5 Types of embryo sacs – monosporic, bisporic and tetrasporic 10. Pollination and Fertilization: 10.1 Introduction and definition 10.2 Types of pollination 10.3 Germination of pollen grain 10.4 Entry of pollen tube-

		porogamy, mesogamy and chalazogamy 10.3 Double fertilization and its significance.
5	July 1st week	11 Endosperm and embryo 11.1 Endosperm: Types - nuclear, helobial and cellular. 11.2 Structure of Dicotyledonous and Monocotyledonous embryo. **Revision and MCQ discussion**

Dr Jagtap S.M.

Dept of Botany

Teaching Plan
S.Y.B.Sc. Botany CBCS Pattern
(Semester IV, Paper II) 2020-2021
BO 242: Plant Biotechnology (2 Cr- 30 Lectures)

Sr. No.	Month	Topic
1	May 4th week	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	June 1st -2nd week	2.3Applications 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. 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	June 3rd- 4th week	4.4 Applications of plant genetic engineering: insect pest resistance, abiotic stress tolerance, herbicide resistance 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 5.3 Bioinformatics-concept, database and its classification, data retrieval tools. Chapter 6 Bioremediation 2L 6.1 Introduction and concept 6.2 Microbial remediation 6.3 Phytoremediation
5	July 1st week	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 **Revision and MCQ discussion**

Dr. Jagtap S.M.
Dept of Botany