

PLANT AND AGRICULTURAL BIOTECHNOLOGY

Semester	Subject Code	Category	Lecture		Theory		P	C
V	21CBT5A	Core - V	6 hrs per week	90	6 hrs per week	90	0	5

COURSE OBJECTIVE: In this course, students will be able to

- ✓ Understand the basic concepts in plant and agriculture biotechnology including characteristics of tissue culture, culture media and its constituents, plant transformation techniques, plant pathology, field crop production techniques, transgenic plants and applications of plant tissue culture.

COURSE OUTCOMES: Up on successful completion of course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL (K1-K4)
CO1	To know the basic of tissue culture, media and culture types	K1
CO2	Understand different plant transformation techniques	K2
CO3	Analyze various plant pathogens and plant disease management	K4
CO4	Analyze the meaning and scope of Agronomy, Field crops-classification with examples.	K4 & K5
CO5	Apply knowledge for the development of transgenic plants	K3

Knowledge Level: K1- Remember, K2- Understand, K3- Apply, K4-analyze

MAPPING WITH PROGRAMME OUTCOMES

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	M	S	S
CO2	S	S	S	M	M	M
CO3	M	S	S	S	M	M
CO4	M	M	S	M	S	S
CO5	M	M	S	M	S	S

S-Strong, M-Medium, L-Low

UNIT-I

PLANT TISSUE CULTURE

18 Hours

Introduction to plant tissue culture, Explant, sterilization techniques, culture media and their constituents.

Culture types, cell and organ differentiation, organogenesis, somatic embryogenesis, somoclonal variation, protoplast culture, regeneration, growth hormones and their regulation.

UNIT -II

PLANT TRANSFORMATION

20 Hours

Ti plasmid, T-DNA integration, binary vector, methods of gene transfer Agrobacterium mediated gene transfer, chloroplast transformation, in-planta transformation, Biolistic, Electroporation, Microinjection, Liposome encapsulation. Advantages and disadvantages of gene transfer.

UNIT-III

FUNDAMENTALS OF PLANT PATHOLOGY

18 Hours

Classification of plant diseases, symptoms, signs, and related terminology. Parasitic causes of plant diseases (fungi, bacteria, viruses), Nonparasitic causes of plant disorders-temperature effects, herbicide injury, mineral deficiencies.

UNIT -IV

FIELD CROP PRODUCTION AND MANAGEMENT

18 Hours

Meaning and scope of Agronomy, Field crops-classification with examples. Tillage-Definition, types of tillage, importance and implements used for tillage, manures and fertilizer application and their types, Irrigation-water managements, methods of irrigation, microirrigation. Soil and climatic requirements, Land preparation, seeds and sowing, cultural practices, manuring, irrigation, plant protection measures, harvesting and yield.

UNIT –V

TRANSGENIC PLANTS AND APPLICATIONS OF PTC

16 Hours

Improvement of agronomic traits: development of Pesticide resistance, herbicide resistance, Production traits: delayed ripening of fruits, increase in vitamin. Production of secondary metabolite-carbohydrate and lipid production. Molecular farming for therapeutic proteins – plantibodies, plantigens, edible vaccines), Case studies.

Distribution of Marks: Theory 80% and Problems 20%

TEACHING METHODOLOGY:

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

TEXT BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Slater A, Scott NW, Fowler MR	Plant Biotechnology: The genetic manipulation of plants (2 nd ed)	Oxford University press.	2008
2.	Smith RH	Plant Tissue culture: Techniques and Experiments(3 rd ed)	Academic Press, USA	2013
3	G.N Agrios,	Plant pathology(4 th ed)	Academ. Press, NewYork	2004
4	Arie Altman and Paul Hasegawa	Plant biotechnology and agriculture	Academic Press	2012
5	Chawla. H.S	Introduction to Plant Biotechnology	Science Publisher	2002

REFERENCE BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Bhojwani SS and Razdan MK	Plant Tissue culture: Theory and Practice,	Elsevier, India.	1996
2.	S.C. Panda	Agronomy	.Agribios Publication, NewDelhi	2006
3	Kamat	Introductory Plant Pathology	Prakashpubl, Jaipur	1967
4	Giri C and ArchanaGiri	Plant Biotechnology	I.K.InternationalPvt Ltd	2007
5	Chopra. V.L and Vedpal .	Applied Plant Biotechnology	Bhat Science Publishers	1999

WEB RESOURCES:

1. https://books.google.co.in/books/about/Agricultural_Biotechnology.html
2. <https://ardhindie.com/pdf/plant-biotechnology-and-agriculture>
3. <https://firequillbooks.com/product/plant-biotechnology>
4. <https://picklelakehotel.com/pdf-free-download/34325-plant>
5. https://www.isaaa.org/.../download/Agricultural_Biotechnology

Syllabus Designer:

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