



**SCHOOL OF BIOENGINEERING
DEPARTMENT OF BIOTECHNOLOGY**

Lesson Plan

IIIrd Year/V Semester

Subject Code : BT 0307

Subject Title : Plant Biotechnology

Faculty Name: Dr. Sarada, D. V.L

Hour	Unit No.	Title	Hours	Learning Outcomes
		PLANT GENOMES AND PLANT TISSUE CULTURE		
1	I	Introduction to gene structure, expression and regulation Implication for plant transformation	1	<ul style="list-style-type: none"> • Provides basic understanding about organization and structure of genes and genomes in plants which forms the basis for plant genetic transformation • Introduces the concept of totipotency unique to the plant kingdom • Provides the in depth knowledge on <i>in vitro</i> growth and regeneration of plants
2	I	Protein targeting, heterologous promoters	1	
3	I	Genome size and organization	1	
4	I	Arabidopsis and new technologies	1	
5	I	Plant tissue culture-plasticity and totipotency	1	
6	I	Culture environment	1	
7	I	Growth regulators, media regulators	1	
8	I	Culture types	1	
9	I	Plant regeneration	1	
		PLANT TRANSFORMATION TECHNIQUES		<ul style="list-style-type: none"> • Provides basic

10	II	Introduction- <i>Agrobacterium</i> mediated gene transfer	1	<p>knowledge about the different types of methods available for gene transfer in plants</p> <ul style="list-style-type: none"> Provides elaborate Knowledge on mechanism of gene transfer using <i>Agrobacterium</i>
11	II	Ti-plasmid	1	
12	II	Process of T-DNA transfer and integration, transformation in plant	2	
13	II			
14	II	Direct gene transfer methods	2	
15	II			
16	II	Binary vectors- Basic features of vectors and optimization	1	
17	II	Clean gene technology	1	
18	II		1	
		TRANSGENIC PLANTS HERBICIDE AND PEST RESISTANCE		
19	III	Herbicide resistance-use of herbicide in modern agriculture	1	
20	III	Strategies for engineering herbicide	1	
21	III	Resistance and environmental impact	1	
22	III	Pest resistance	1	
23	III	Nature and scale of insect / pest damage to crop	1	
24	III	GM strategies- Bt approach to insect resistance	2	
25	III			
26	III	Copy nature strategy	1	
27	III	Insect resistant crops and food safety	1	
		PLANT DISEASE RESISTANCE AND STRESS TOLERANCE		<ul style="list-style-type: none"> Introduces the plant pathogen interaction and the natural disease resistant pathways Provides in depth knowledge about genetic modification of plants for disease resistance including
28	IV	Introduction-plant-pathogen interactions	1	
29	IV	Natural disease resistance pathways	2	
30	IV			
31	IV	Biotechnological -Approaches to disease resistance	1	

32	IV	Plant viruses- types-entry and replication	1	bacterial fungal and viral diseases. • Provides detailed knowledge about the different types of abiotic stresses and the various biotechnological approaches to combat water stress
33	IV	Transgenic approaches for viral resistance, PDR	1	
34	IV	Stress tolerance, Abiotic stress	1	
35	IV	Water deficit stress and Various approaches for tolerance	2	
36	IV			
MOLECULAR FARMING AND GM CROPS FUTURE PROSPECTS				
37	V	Introduction-carbohydrates and lipids production	2	
38	V	Molecular farming of proteins	1	
39	V	Economic considerations for molecular farming.	2	
40	V			
41	V	GM crops-current status		
42	V	Concerns about GM crops	2	
43	V			
44	V	Regulations of GM crops and products	1	
45	V	Greener genetic engineering	1	

Prescribed Text Books:

1. Principles of genome Analysis and Genomics by S. B. Primrose and R. M. Twyman
2. Plant Biotechnology- The genetic manipulation of Plants by Adrian Slater, N. W. Scott and M. R. Flower

Names of the Staff handling the subject:

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