Lesson Plan

Name of the Faculty : Dr. Virender Singh
Discipline : Biotechnology
Semester : 6th
Session : Feb 2021 to Jun 2021
Subject : Plant Biotechnology (Theory code- BTE-304A; Practical code- BTE-314 LA)
Lesson Plan Duration : 14 weeks
**Work Load(Lecture/Practical) per week (in hours): 03 Practical: 3

Week	**Theory**		**Practical**	
	Lecture Day	**Topic(including assignment /test)**	**Practical Day**	Topic
1st	1st	Introduction to the subject	1st	Laboratory set Up
	2nd	Concept of Cellular Totipotency		
	3rd	Types of culture: Seed culture, Embryo culture, Cell culture & Protoplast culture		
2nd	4th	Callus culture, Organ culture	2nd	Preparation of nutrient stock solutions and chelating agents
	5th	Secondary metabolites		
	6th	Secondary metabolites production and applications		
3rd	7th	Stages of micropropagation	3rd	continue
	8th	Meristem and shoot tip culture		
	9th	Axillary bud proliferation		
4th	10th	Organogenesis	4th	Handling and sterilization of media and plant material
	11th	Embryogenesis		
	12th	Advantages and disadvantages of micropropagation		
5th	13th	Anther/ Microspore culture	5th	Preparation of culture media from stock solution
	14th	Gynogenic haploids, Significance and use of haploids		
	15th	Chromosome elimination techniques & chromosome doubling		
6th	16th	Methods of protoplast isolation, protoplast development	6th	Establishment of callus culture using different explants
	17th	Somatic hybridization, identification and selection of hybrid cells		
	18th	Cybrids, potential of somatic hybridization & its limitations		
7th	19th	Nomenclature & methods of Somaclonal variations	7th	Preparation of culture media for direct plant regeneration from axillary nodes and nodal tissues
	20th	Causes of Somaclonal variations and Gametoclonal variations		
	21st	Applications &disadvantages of somaclonal variations		
8th	22nd	Method of cryopreservation and cryoprotectants	8th	Innoculation of axillary nodes and nodal tissues
	23rd	Slow growth cultures and		

		Advantages & disadvantages		for direct plant regeneration.
	24th	Nitrogen fixation & nodulation		
9th	25th	Nitrogenase, hydrogenase	9th	Media preparation for seed culture and callus propagation.
	26th	Growth promotion by free-living bacteria		
	27th	Transient and stable gene expression		
10th	28th	Chimeric gene vectors, marker genes	10th	Seed culture on MS media
	29th	Selectable markers		
	30th	Agrobacterium mediated method of gene transfer		
11th	31st	Physical methods of gene transfer	11th	Inoculation and subculture for mass propagation of callus
	32nd	Chemical methods of gene transfer		
	33rd	Resistance to biotic stresses: insect resistance		
12th	34th	Virus and disease resistance	12th	Isolation of plant genomic DNA using CTAB method.
	35th	Development of abiotic stress and senescence-tolerance: Oxidative stress, salt stress		
	36th	Herbicide resistance and Delay in fruit ripening		
13th	37th	Transgenics for improved quality	13th	Organogenesis/somatic embryogenesis from callus culture
	38th	Terminator seed technology		
	39th	Trangenic plants as bioreactors		
14th	40th	Class Test	14th	Agrobacterium mediated method of gene transfer

Faculty Signature