

Lesson Plan

Name of the Faculty : Dr. Ram Kumar Pundir

Discipline : Biotechnology

Semester : 4th

Subject : Industrial Biotechnology (Theory: BTE-208A; Practical: BTE-216LA)

Lesson Plan Duration:15 Weeks (From April, 2021 to Aug, 2021)

****Work Load(Lecture/Practical) per week(in hours): Lecture- 03; Practical- 03**

Week	Theory		Practical	
	Lecture Day	Topic(including assignment /test)	Practical Day	Topic
1 st	1 st	Industrial Biotechnology: Introduction, objectives and scope	1	Sterilization Techniques (Media, air & water)
	2 nd	-do-		
	3 rd	Fermentation Technology: Biochemistry of Fermentation,		
2 nd	4 th	Traditional and modern Biotech., A brief Survey of Organism, Processes and products	2	Construction of various fermenters (bioreactors)
	5 th	Basic Concept of upstream and down stream Processing in Fermentation Technology		
	6 th	-do-		
3 rd	7 th	Production of Primary metabolites: Organic Acids	3	Identification of industrially important microorganisms e.g. molds, yeasts and bacteria.
	8 th	-do-		
	9 th	Dextran and Amino acids		
4 th	10 th	Alcoholic Beverages: Wine and Beer	4	Production of various products in the lab. Alcohol, wine, cellulase, protease and bread.
	11 th	-do-		
	12 th	Production of Industrial Enzymes- Amylase and Protease		
Assignment I/Test 1 of Unit I				
5 th	13 th	Lipase, Xylanase, Lignocellulase	5	Isolation of antibiotic producing microorganisms from the soil.
	14 th	-do-		
	15 th	Production of Acylamide		
6 th	16 th	Adipic Acid and 1,2 Propanediol	6	Penicillin production and testing of antimicrobial activity.
	17 th	Production of Biopesticides: Characteristics of Biopesticides		
	18 th	Production of Biopesticides: Bt-toxin, Kasugamycin,		
7 th	19 th	Beauverin, Devine and Collogo	7	Isolation of

	20 th	-do-		streptomycin-resistant mutants by replica plating method.
		Assignment II/Test II of Unit II		
	21 st	Beneficial soil microorganisms; Production of biofertilizers:		
8 th	22 nd	-do-	8	Isolation of UV induced auxotrophic mutants.
	23 rd	-do-		
	24 th	Production of Biofuels: Basic concepts and important types of biofuels		
9 th	25 th	Fuel from biomass	9	Testing of microbial enzyme activity in the lab.
	26 th	Production and economics of biofuels, Biogas		
	27 th	-do-		
10 th	28 th	Single cell Protein	10	Determination of cell growth.
	29 th	Mushroom Cultivation		
	30 th	Biopreservatives: Nisin		
11 th	31 st	Cheese, Biopolymers	11	Production of organic acids (Citric and lactic) by microorganisms.
	32 nd	Bioflavours and Biopigments		
		Assignment III/Test III of Unit II		
	33 rd	Microbial production of Flavours and fragrances		
12 th	34 th	-do-	12	Production of industrially important enzymes (protease, amylase) by microorganisms.
	35 th	Microbial pigments in textile and food industries		
	36 th	Improvement of industrially important microorganism		
13 th	37 th	selection of mutants,		Revision
	38 th	Use of rDNA technology		
	39 th	Integrated Strain Improvements Program (Precision Engg. Technology)		
14 th	40 th	Microbial production of Pharmaceuticals- Antibiotics		Revision
	41 st	Enzyme Inhibitors		
	42 nd	Production of Vitamins (E, K B2 AND B12)		
15 th	43 rd	Genetic Engineering of production of non-ribosomal peptides (NRPS) and Poly Ketides		Revision
	44 th	Anticancer drugs		
	45 th	Assignment IV/Test IV of Unit IV		