

Lesson Plan

Name of the Faculty : Dr. Vikas Sharma
Discipline : Biotechnology
Semester : 8th
Subject : **BIOCATALYSIS AND BIOTRANSFORMATION(BT-402N)**
Lesson Plan Duration : 15 Weeks (From February, 2021 to Jun, 2021)

Work Load(Lecture/Practical) per week(in hours): Lecture- 03; Tutorial : 01; Practical- 00

Week	Theory	
	Lecture Day	Topic(including assignment /test)
1 st	1 st	Introduction to biocatalysis and Biotransformation
	2 nd	-do-
	3 rd	Current market of biocatalysis , fermentation and applied biocatalysis,
2 nd	4 th	Types of bioconversion reactions, limitation of Biocatalysis
	5 th	Procedure for biotransformation, Use of cells and enzymes for biotransformation,
	6 th	Use of cells and enzymes for biotransformation,
3 rd	7 th	Biotransformation reactions: Types of bioconversion reactions,
	8 th	Procedure for biotransformation,
	9 th	Genetic manipulations of organism for biotransformation, applications of bioconversions.
4 th	10 th	Reaction types of microbial transformation from steroids
	11 th	-do-
	12 th	microbial breakdown of sterols side chain
		OBT-1
5 th	13 th	Transformation of non- steroidal compounds: ascorbic acid,
	14 th	dihydroxy acetone from glycerol, prostaglandins,
	15 th	hydantoinases, carbamylases,
6 th	16 th	hydantoinases, carbamylases, catalytic antibodies.
	17 th	Transformation of antibiotics: Acylases and peptidases,
	18 th	reaction of penicillin
7 th	19 th	penicillin and cephalosporin substrates,
	20 th	protection of amino groups
	21 st	Transformation of pesticides: Accumulation of pesticides
8 th	22 nd	pesticides as carbon source,
	23 rd	conjugate formation
	24 th	Biotransformation of nitrile group: Nitrile Hydratase and Nitrilases,
9 th	25 th	Biotechnology of Nitrile transformation,
	26 th	Regio and stereo selective biotransformation of Nitriles,
	27 th	-do-
10 th	28 th	Commercial processes and redesign of existing enzymes by protein engineering,
	29 th	Search for Novel Nitrile biotransforming activities,
	30 th	metabolic engineering by multistep biotransformation,
11 th		Cyanide biotransformation.
	31 st	OBT-2
	32 nd	Biotransformation by lipases: Commercial lipases, properties and application of lipases,
12 th	33 rd	lipid or surfactant coated lipases, inter-esterification of fats and oils,
	34 th	enantioselective esterification by lipases,

	35 th	-do-
13 th	36 th	Commercial application (food ingredients and enantiomerically pure chemical and pharmaceutical intermediates)
	37 th	Alkaloid biotransformation: Tropane Alkaloid biosynthesis,
	38 th	Alkaloid biotransformation:: microbial metabolism of Tropane alkaloids,
14 th	39 th	Alkaloid biotransformation:: transformation of morphine alkaloid by <i>Pseudomonas putida</i> M10
	40 th	-do-
	41 st	microbial transformation of heroin.
15 th	42 nd	OBT-3
	43 rd	Revision
	44 th	Revision

