

Department of Liberal Education Era University, Lucknow

Course Outline Effective From: 2023-24

Name of the Program	B.A. / B.Sc. (LIBERA	AL EDUCA	TION)	Year/ Semester:	3 rd / 6 th				
Course Name	ourse Industrial		MB306	Type:	Theory				
Credits	()4		Total Sessions Hours: 60 Hours					
Evaluation Spread	Internal Continuous Assessment:	50 Marks		End Term Exam:	50 Marks				
Type of Course	C Compulsory	Core		C Creative	C Life Skill				
Course Objectives	This module will help students to understand following; a. Advantages & limitations in bioprocess b. Intellectual property rights c. Important microbes; Industrial microbiology d. Fermentation and its types e. Down-stream processing f. Purification; solvent extraction g. Production of; alcohol, vitamin, enzyme, amino acid, hormones & vaccine h. Production of; Biofuel								
attributes: Course	comes (CO): After	the succes		e completion, learners w	vill develo	pp following			
Outcome (CO)	Attributes								
CO1	Upon completion the students will learn about a typical Bio process: Introduction, advantages & limitations, Patents and intellectual property rights and important characteristics of microbes used in Industrial Microbiology.								
CO2	Students will be able to learn the process of fermentation with its types.								
CO3	They will be able to know about the processing & selection of best microbial strains for the industry.								
CO4	Students will gain knowledge about production of alcohol, vitamin enzyme, amino acid, hormones, vaccine & biofuel.								
Pedagogy	Interactive, discussion-bases, student-centered, presentation.								
Internal Evaluation Mode	Mid-term Examination: 20 Marks Activity: 10 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks								
Session Details		,	Topic		Hours	Mapped CO			
Unit 1	&Taxonomic diver	sity of indu Bio proc	ustrially us cess: Intro	ndustrial microbiology reful microorganisms duction, advantages & ghts	CO1				

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		 Purification (solvent extraction & chromatography) Activity: Solvent extraction by distillation unit and performance of 							c		1			
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			 Detection and assay of the product Recovery (intercellular and extracellular product) 											
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Unit 3				_	_	_	ıtara					15		O3
			Activity: Making fermented plant juice (FPJ) for crop treatments Down-stream processing steps					ts	1.5	~	02			
	 Fermenter design Types of fermentation –Single, Batch, Continuous 													
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Para Text

Unit 1:

1. http://foodhaccp.com/foodsafetymicro/onlineindex.html

Unit 2:

1.http://www.cpe.rutgers.ed/courses/current/lf0401wa.html

Unit 3:

 ${\bf 1.~\underline{https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2291482/pdf/pgen.1000024.pdf}$

Unit4:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3253344/pdf/nihms-312011.pdf

Recapitulation & Examination Pattern

Internal Continuous Assessment:							
Component	Marks	Pattern					
Mid Semester	20	Section A: Contains 10 MCQs/Fill in the blanks/One Word					
		Answer/ True-False type of questions. Each question carries 0.5					
		mark.					
		Section B: Contains 07 descriptive questions out of which 05					
		questions are to be attempted. Each question carries 03 marks .					
Activity	10	Will be decided by subject teacher					
Class Test	05	Contains 05 descriptive questions. Each question carries 01					
		mark.					
Online Test/ Objective	05	Contains 10 multiple choice questions. Each question carries 0.5					
Test		mark.					
Assignment/ Presentation	05	Assignmet to be made on topics and instruction given by subject					
		teacher					
Attendance	05	As per policy					
Total Marks	50						

Course created by: Dr. Manaal Zahera

Signature:

Approved by: Dr. Amita Jain

Signature: