Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	**B.A. / B.Sc. (LIBERAL EDUCATION)**			**Year/ Semester:**	**3rd / 6th**
Course Name	**Food Microbiology**	**Course Code:**	**MB305**	**Type:**	**Theory**
Credits	**03**			**Total Sessions Hours:**	**45 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**40 Marks**		**End Term Exam:**	**35 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	This module will help students to understand following; a. History & scope of food microbiology b. Importance & types of microorganisms in food c. Spoilage of various foods d. Microbial Examination of food e. Modern technologies; Food preservation f. Fermented Foods g. Probiotics h. Food borne diseases; food intoxication & food infections i. Physical & Chemical properties of milk j. Methods of analysis & preservation of milk				
Course Outcomes(CO): *After the successful course completion,learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	Upon completion the students will learn about the history, scope, concept and the importance of microorganisms in food microbiology.				
CO2	They will be able to learn about the symptoms of deteriorated food and assimilate knowledge about the modern food preservation techniques.				
CO3	Students will understand the food intoxication and food infections caused by food borne microorganisms.				
CO4	Students will be acquainted with the knowledge about the microbiological methods & analysis of milk and also method of preservation of milk and milk products.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 20 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	**Introduction to food & nutrition** • History, Development and Scope of food microbiology • Concept of food and nutrients • Physiochemical properties of food			10	CO1

	• Importance and types of microorganisms in food (bacteria, mold and yeast) • Food as a substrate for microorganism- Intrinsic and extrinsic factors that affect growth and survival of microbes in food • Natural flora and source of contamination of foods in general		
Unit 2	**Microbial spoilage of various foods ,Food Preservation and Fermented foods** • Principal; Spoilage of vegetables, fruits, meats, eggs, milk and butter, bread, canned foods • Microbial examination of food DMC, viable count, examination of faecal Streptococci. • Food quality monitoring • Biosensors and Immunoassays • Basic Principles, Methods (heating, freezing, dehydration, chemical preservatives, radiation) • Modern technologies in food preservation, Packaging material. • Fermented dairy products (cheese, butter, yoghurt), • Kefir; Other Fermented foods- Soya sauce, Saurkraut, Dosa, Tempeh • Probiotics: health benefits, types of microorganisms used, probiotic foods available in market..	15	CO2
Unit 3	**Food borne diseases** • Food intoxication- Staphylococcus aureus, Clostridium botulinum and Mycotoxins • Food infections- E.coli, Salmonellosis, Bacillus cereus, Sheigellosis, Listeria	10	CO3
Unit 4	**Microorganisms and milk** • Physical and chemical properties of milk • Milk as a substrate for microorganisms • Microbiological analysis of milk – Rapid Platform test, standard plate count, MBRTtest, alkaline phosphatase enzyme test, DMC • Method of preservation of milk and milk product, pasteurization sterilization and dehydration **Food sanitization and control** • HACCP, Indices of food sanitary quality and sanitizers • Microbiological quality standard of food	10	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1								2				1	
CO2			2	2	2				2				1	
CO3			2			2	2		2	2	3		1	
CO4			2	2	2	2	2		3	3	3		1	

Strongcontribution-3, Averagecontribution-2, Lowcontribution-1,

Suggested Readings:

Text- Books	1.Adams & Moss, Food Microbiology, Published by Royal Society of Chemistry, Cambridge, U.K.

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Para Text	**Unit 1:** 1. **http://www.vlab.co.in/** **Unit 2:** 2. **http://www.vlab.amrita.edu/** **Unit 3:** 1. **http://asm.org/articles/2020/december/virtual-resources-to-teach-microiology-techniques** **Unit4:** 1. **https://www.frontiersin.org/articles/10.3389/fpls.2019.00845/full**

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**.
Class Test	05	Contains **05 descriptive questions.** Each question carries **01** mark.
Online Test/ Objective Test	05	Contains **10 multiple choice questions.** Each question carries **0.5** mark.
Assignment/ Presentation	05	Assignment to be made on topics and instruction given by subject teacher
Attendance	05	As per policy
Total Marks	**40**	

Course created by: **Dr. Manaal Zahera** **Signature:**	**Approved by: Dr. Amita Jain** **Signature:**