

Name of Faculty	:	Faculty of Science
Name of Program	:	Bachelor of Science
Course Code	:	2BSM01
Course Title	:	Food Microbiology
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	Foundational knowledge and skills and basic knowledge of food microorganisms.
Course Objective	:	The syllabus objectives for an undergraduate course in Food Microbiology typically aim to provide students with a comprehensive understanding of microorganisms relevant to food, their interactions with food products, and their impact on food safety and quality. This course provides an overview of the fundamental principles of microbiology as they relate to food. Students will learn about the types of microorganisms found in food, growth, survival and their impact on food quality and safety.
Course Outcomes	:	At the end of this course students will be able to:
	CO1	Understanding the concepts of food microbiology.
	CO2	Understand the factors that influence microbial growth in foods, such as temperature, pH, water activity, and nutrient availability.
	CO3	Recognize the microbial causes of food spoilage, factors that contribute to spoilage, and strategies to prevent or slow down spoilage processes.
	CO4	Explore various food preservation techniques and understand their effects on microbial viability and food quality.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	2	4	50	25	50	25	150

Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P - Practical, C - Credit, SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	Introduction to Food Microbiology Introduction to microbiology and its significance in the food industry Classification of microorganisms Historical perspective of food microbiology.	10	22%	CO1
2	Microbial Growth and Control Factors affecting microbial growth (temperature, pH, water activity, etc.) Microbial growth curves Control methods (thermal processing, chemical preservatives, irradiation, etc.)	10	22%	CO2
3	Food Spoilage Microorganisms Types of food spoilage microorganisms (bacteria, molds, yeast) Signs of food spoilage Factors influencing spoilage	15	34%	CO3
4	Food Preservation and Fermentation Food preservation techniques (canning, pasteurization, drying, etc.) Fermentation processes in food production Role of beneficial microorganisms in food fermentation	10	22%	CO4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	25	25	-	25	-	25

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments

Sr. No.	Name of Experiment	Teaching Hours
1	Lab safety rules and protocol	02
2	Aseptic techniques and sterile handling	02

3	Microbial enumeration : Colony forming units (CFU)	02
4	Isolation of micro-organisms from spoiled food.	02
5	Gram staining and microscopic examination of microorganisms isolated.	02
6	Examination of spoiled food samples	02
7	Preservation of potato by UV radiation	02
8	Preservation of Onion by UV radiation	02
9	Isolation of lactic acid producing bacteria.	02
10	Microorganisms of fruits and vegetables- collection of sample for isolation	02
11	Microorganisms in Bread, Jams and Jellies- collection of sample for isolation	02
12	Examination of Canned foods.	02
13	Microorganisms of Pickles.	02
14	Conduct accelerated shelf-life studies to estimate the shelf life of food products under different storage conditions.	02
15	Develop and evaluate Hazard Analysis and Critical Control Points (HACCP) plans for specific food products to ensure safety	02

Major Equipment /Instruments

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Analytical Balance
2	Autoclave
3	Micropipettes
4	Stains
5	Light Microscope
6	Anaerobic jar
7	UV Chamber
8	Hot Air Oven
9	Centrifuge
10	Bioreactor

Suggested Learning Websites

Sr. No.	Name of Website
1	http://www.simbhq.org/

Reference Books

Sr. No.	Name of Reference Books
1.	"Food Microbiology Laboratory" by Lynne McLandsborough:
2.	"Modern Food Microbiology" by James M. Jay, Martin J. Loessner, and David A. Golden:



3.	"Food Microbiology: Fundamentals and Frontiers" by Michael P. Doyle and Robert L. Buchanan:
4.	"Food Microbiology, Third Edition" by Martin R. Adams and Maurice O. Moss:
5.	Food Microbiology" by William C. Frazier and Dennis C. Westhoff: