



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Food Engineering & Technology

Subject Code: 3175105

Subject Name : Food Preservation by Fermentation

WEF Academic Year :	2022-23
Semester :	7
Category of the Course :	Professional Elective Course-VI

**Prerequisite:Nil**

**Rationale:** This subject explores the principles and techniques of fermentation as a method of preserving and enhancing the quality of food. It equips students with knowledge on the microbial processes, applications, and industrial-scale fermentation for various food products, promoting sustainable and safe food preservation.

**Course Scheme:**

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	P		Theory		Practical		
			ESE (E)	PA(M)	ESE (V)	PA (I)		
3	0	2	4	70	30	30	20	150

**Course Content:**

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Introduction to Food Fermentation Definition, history, and importance of fermentation Types of fermentation: Lactic acid, alcoholic, acetic acid, alkaline Advantages and limitations of fermentation as a preservation technique	5	15
2	Microorganisms Involved in Food Fermentation: Classification: Bacteria, Yeasts, Molds Role of lactic acid bacteria, yeast strains, and others in food fermentations Starter cultures: types, selection criteria, maintenance	8	20
3	Fermentation Process Technology: General steps and parameters of controlled fermentation Equipment and vessels for laboratory and industrial fermentation Downstream processing: Separation, purification, packaging	11	25
4	Fermented Food Products and Applications: Dairy products: Yogurt, cheese, butter milk Cereal-based products: Idli, dosa, bread, beer Vegetable fermentation: Sauerkraut, pickles Meat and fish products: Salami, fermented fish Non-alcoholic and alcoholic beverages: Wine, vinegar, kombucha	10	20



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Food Engineering & Technology

Subject Code: 3175105

Subject Name : Food Preservation by Fermentation

5	Quality Control, Hygiene, and Safety in Fermentation Food safety hazards and control measures in fermented products Microbial spoilage and defect prevention HACCP, FSSAI, BIS, and international standards for fermented foods	10	20
---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----	----

## Reference Book:

- *Food Microbiology* — Frazier & Westhoff
- *Fundamentals of Food Process Engineering* — Romeo Toledo
- *Fermented Foods and Beverages of the World* — Jyoti Prakash Tamang
- *Microbiology of Fermented Foods* — Brian J. Wood
- Relevant BIS / FSSAI manuals and Codex Alimentarius guidelines

## Suggested Course Practical List:

- Preparation of curd and yogurt using controlled starter culture
- Fermentation of idli/dosa batter and pH monitoring
- Alcoholic fermentation using yeast (fruit juice to wine)
- Vegetable pickle fermentation using brine solution
- Microscopic examination and isolation of fermentation microbes
- Testing acidity and alcohol content in fermented foods
- Quality control checks for commercial fermented products
- Visit to a fermented food or beverage processing unit (if possible)

\* \* \* \* \*