



**Subject:** Fundamental of Food Technology- BSCFT16324

**Type of course:** Minor

**Prerequisite:** Fundamental understanding of biological and chemical principles, along with curiosity about how food composition, processing, and preservation impact health and society.

**Rationale:** This course equips students with foundational knowledge of food composition, processing, preservation, and safety, enabling them to understand how scientific principles are applied to develop nutritious, safe, and sustainable food products for society.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks					Total Marks
CI	T	P		SEE		CCE			
			Theory	Practical	MSE	LWA/V	ALA		
4	0	0	4	100	00	30	00	70	200

*Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voice; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities*

3 Credits \* 25 Marks = 75 Marks (each credit carries 25 Marks) Theory  
1 Credits \* 25 Marks = 25 Marks (each credit carries 25 Marks) Practical  
SEE 100 Marks will be converted in to 50 Marks  
CCE 100 Marks will be converted in to 50 Marks  
It is compulsory to pass in each individual component.



Course Content:

Unit No	Course content	Hrs	% Weightage
1	<p><b>Chapter-1: Introduction to Food Technology</b></p> <ul style="list-style-type: none"> <li>• Definition, scope, and importance of food technology</li> <li>• Major components of food: carbohydrates, proteins, lipids, vitamins, and minerals</li> <li>• Functional and sensory properties of food constituents</li> <li>• Role of food technologists in industry, research, and public health</li> <li>• Functional foods and nutraceuticals</li> <li>• Sustainable food production and waste management</li> </ul>	15	25
2	<p><b>Chapter-2: Food Processing and Preservation Techniques</b></p> <ul style="list-style-type: none"> <li>• Principles and objectives of food preservation</li> <li>• Thermal processing: pasteurization, sterilization, blanching, canning</li> <li>• Low-temperature processing: refrigeration, freezing, cryogenic freezing</li> <li>• Dehydration and concentration methods</li> <li>• Non-thermal techniques: irradiation, high-pressure processing, pulsed electric fields</li> <li>• Use of natural and chemical preservatives</li> </ul>	15	25
3	<p><b>Chapter-3: Food Microbiology and Fermentation</b></p> <ul style="list-style-type: none"> <li>• Role of microorganisms in food spoilage and preservation</li> <li>• Types of spoilage in different foods: dairy, meat, fruits, and vegetables</li> <li>• Fermented foods: principles and examples (bread, cheese, yogurt, pickles, soy products)</li> <li>• Industrially important microorganisms and their applications</li> <li>• Starter cultures and probiotics in food industry</li> </ul>	15	25



4	<b>Chapter-4: Food Quality and Safety</b> <ul style="list-style-type: none"> <li>● Concept of food quality: sensory, nutritional, and microbiological aspects</li> <li>● Food contamination and adulteration: sources, effects, detection methods</li> <li>● Food safety standards and regulations: FSSAI, Codex Alimentarius, HACCP, ISO 22000</li> <li>● Quality control and assurance in food industries</li> <li>● Packaging materials, labeling, and storage stability</li> </ul>	15	25
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### Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	<b>Food Composition Chart</b> Students will research one assigned food component (Carbohydrates, Proteins, Lipids, Vitamins, or Minerals) and prepare a chart showing rich food sources, nutritional value per 100 g, and dietary importance. Upload the chart to the GMIU web portal.	10
2	<b>Report on Food Preservation Technique</b> Prepare a comparative report on any three food preservation methods (e.g., refrigeration, dehydration, pasteurization) including their principle, example food products, and effect on nutrient quality and shelf life. Upload the report to the GMIU web portal.	10
3	<b>Unveiling the Sweetness: Estimating Carbohydrates in Fruits</b> Students will analyze and compare the carbohydrate content in various fruits, exploring their natural sweetness, nutritional significance and upload to the GMIU web portal.	10
4	<b>Find the Microbes in Foods (Butter and Curd)</b> Students will study the effect of different temperatures on microbial growth in food samples. They will observe, compare, and analyze microbial colonies under varying storage conditions to understand how temperature influences food spoilage and safety, and upload their results on the GMIU web portal	10
5	<b>Study of Yeast in Fermented Foods (like Breaḡ or Dosa Batter)</b> Students will isolate and observe yeast present in fermented foods such as bread or dosa batter. They will analyze microbial growth, relate it to the fermentation process, and upload their observations on the GMIU web portal.	10



6	<b>Effect of Temperature on Microbial Growth in Food</b> Students will study the effect of different temperatures on microbial growth in food samples. They will observe, compare, and analyze microbial colonies under varying storage conditions to understand how temperature influences food spoilage and safety, and upload their results on the GMIU web portal	10
7	<b>Attendance</b>	10
<b>Total</b>		<b>70</b>

### Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	40%	20%	10%	-	

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

### Course Outcome:

After learning the course the students should be able to:	
CO1	Understand the basics of food technology and its importance in the food industry and daily life.
CO2	Explore the science of food preservation, learning how to keep food fresh, flavorful, and shelf-stable for longer.
CO3	Analyze the role of microorganisms in food spoilage and fermentation, and identify their industrial and health-related applications.
CO4	Gain knowledge on how to ensure food quality and safety, and the importance of following food safety standards.



### **Instructional Method:**

The course delivery method will depend upon the requirement of content and the needs of student. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction. Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e- courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment / Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

### **Reference Books:**

1. Potter, N. N., & Hotchkiss, J. H. (2012). **Food science**. Springer Science & Business Media.
2. Ortega-Rivas, E. (2012). Classification of food processing and preservation operations. In **Non-thermal food engineering operations** (pp. 3-10). Boston, MA: Springer US..
3. Sivasankar, B. (2002). **Food processing and preservation**. PHI Learning Pvt. Ltd .
4. Dilbaghi, N., & Sharma, S. (2007). **Food and industrial microbiology**. Hisar: University of Science and Technology.
5. Manay, N. S. O. (2001). **Food: facts and principles**. New Age International.

