



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV01009021

Subject Name: Food Chemistry

w. e. f. Academic Year:	2024-25
Semester:	1
Category of the Course:	Professional Core

Prerequisite:	NA
Rationale:	The course "Food Chemistry" aims to build foundational knowledge of the chemical principles underlying food composition and processing. It introduces students to the chemistry of water, carbohydrates, lipids, and proteins in food systems, focusing on their roles, properties, and how they affect food quality, stability, and shelf life. Understanding these aspects is essential for effective food processing, quality control, and product development, allowing students to appreciate the molecular interactions that determine food's texture, flavor, and nutritional profile.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Knowledge about the moisture and water activity and understand the basic concept of shelf life of foods.
02	Study of carbohydrates to understand the properties and role of carbohydrates in foods.
03	Knowledge of structure of fatty acids, their physical and chemical properties.
04	Study of properties of food protein, structure and understand the functional role of protein in foods.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE (E)		PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	0	3	50	0	0	0	50



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Water: Role of water in foods, Structure of water and ice, Types of water, water activity and shelf life of food.	11	25
2.	Carbohydrate: Classification of carbohydrate, properties of monosaccharide, disaccharide and complex carbohydrates, invert sugar, Application of carbohydrate in foods, modified starches.	12	25
3.	Lipids: Classification of lipid, Role of lipid in foods, Physical and chemical properties of lipid, Qualitative changes in fats and oil.	11	25
4.	Protein: Classification and structure, Properties of proteins, Denaturation of proteins	11	25
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	20	20	10	10	15

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Food chemistry Author: L.H.Meyer (CBS Publisher, Delhi)
2. Foods: Facts and Principle Author: N.Shakuntala Manay and M. Sadaksharaswamy (New Age International Publisher)
3. Food chemistry Author: O.R. Fennema (Marcel Dekkar Inc.)
4. Food chemistry Author: H.D. Belitz and W. Groech (Springer Publication)



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5. Food preservation and processing Author: M. Kalia and S. Sood (Kalyani Publisher)

(b) Open-source software and website:

1. **USDA FoodData Central** - <https://fdc.nal.usda.gov/>
A database with information on food components, nutrients, and chemical profiles, useful for studying food composition.
2. **Open Food Facts** - <https://world.openfoodfacts.org/>
A global, open database of food products, providing data on ingredients, nutritional facts, and labels.
3. **R and Python Libraries (e.g., Pandas, SciPy)**
Widely used for statistical analysis, these open-source programming tools aid in analyzing food chemistry data, such as nutrient composition and quality assessments.
4. **European Food Safety Authority (EFSA)** - <https://www.efsa.europa.eu/>
Provides resources and research reports on food safety, additives, contaminants, and nutritional content.
5. **Codex Alimentarius** - <http://www.fao.org/fao-who-codexalimentarius/>
Contains international standards and guidelines on food safety and quality control practices, which are essential for understanding global food chemistry standards.

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