



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3131406
Semester – III
Subject Name: Food Chemistry

Type of course: Engineering Science

Prerequisite: Nil

Rationale: Food chemistry is one of the major core components of food technology. Study of food chemistry enables to know the properties of water, carbohydrate, fats, proteins as well as food additives and its role in foods. It also helps to know the chemical changes in foods during handling, processing and storage. In addition it involves the study and development of food and its quality evaluation. This course provides the students with knowledge on the chemical constituents of food and their functional significance in food systems.

Teaching and Examination Scheme:

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

Content:

Sr. No.	Content	Total Hrs
1	Water: Role of water in foods, Structure of water and ice, Types of water, water activity and shelf life of food.	8
2	Carbohydrate: Classification of carbohydrate, properties of monosaccharide, disaccharide and complex carbohydrates, invert sugar, Application of carbohydrate in foods, modified starches.	10
3	Lipids: Classification of lipid, Role of lipid in foods, Physical and chemical properties of lipid, Qualitative changes in fats and oil.	8
4	Protein: Classification and structure, Properties of proteins, Animal and vegetable proteins, Denaturation of proteins.	8
5	Food Additives: Functions, characteristics, selection criteria, safety of food additives, Preservatives, Sweeteners, Leavening agents, Antioxidants, Bleaching agents, Improvers, Emulsifiers, Stabilizers & Thickeners, Colouring agents & pigments, Flavouring agents, Anticaking agents, Humectants.	8



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3131406

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	50	25	15		

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

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.

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

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Knowledge about the water or moisture and water activity helps to understand the basic concept of shelf life of foods. It also enables to know the different ways to control the water activity of foods and thereby increase in shelf life of foods.	19
CO-2	Study of carbohydrates helps to understand the properties and role of carbohydrates in foods. Knowledge of starches and modified starches will help in qualitative improvement in foods.	24
CO-3	Knowledge of structure of fatty acids, physical and chemical properties, effect of deep fat frying helps to understand the basic concepts about the role of lipid in various foods. Study of lipid also helps to understand the changes take place in foods while processing and storage.	19
CO-4	Study of properties of food protein, structure helps in understanding the functional role of protein in foods, it's behaviour during different stages of processing.	19
CO-5	Knowledge of food additives helps in understanding the principles whereby food molecules can be selected for use as ingredients in food formulations and the related factors that can be controlled during handling, processing and storage to enhance the product quality.	19



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3131406

List of Experiments:

1. Preparation of standard solutions
2. Determination of moisture content of different food samples by air oven method
3. Determination of moisture content by infra red moisture balance
4. Determination of protein content in food samples by micro kjeldahl apparatus
5. Determination of crude fat content in different oilseeds by soxhlet apparatus
6. Determination of ash content of food sample
7. Determination of acid value of oil
8. Determination of iodine value of a given oil
9. Determination of peroxide value of a given oil sample
10. Determination of acidity and pH of fruit juice
11. Open ended problem (OEP)

Major Equipment:

1. Electronic balance
2. Hot air oven
3. Infrared moisture meter
4. Micro Kjeldhal unit
5. Soxhlet apparatus and heater
6. Muffle furnace
7. Water bath
8. Glass wares, plastic wares and metal wares

List of Open Source Software/learning website:

- www.ift.org
- www.rsc.org
- www.fao.org
- NPTEL