GUJARAT TECHNOLOGICAL UNIVERSITY

FOOD PROCESSING & TECHNOLOGY (14)
DESIGN & FORMULATION OF FOODS
SUBJECT CODE: 2151401
B.E. 5th SEMESTER

Type of course: Food Processing Technology

Prerequisite: Nil

Rationale: Today's food development continues to grow in the direction of a "technoculinary" trend—connecting science or technology with the culinary arts. Cultural influences, food trends, and nutrition are incorporated into the development of foods.A food developer needs to combine technical knowledge, creative talent, and an understanding of the cultural aspects of the cuisine and its preparation, in order to develop products that will be a success in the marketplace. The product developer needs to understand the creative use of spices and flavorings in addition to technical know-how.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Nutritional Concept in Food Design:** Nutritive value and anti-nutritional factors present in cereals, pulses, oil seeds , fruits, vegetables, fish, meat and eggs, effect of processing on nutritive value of foods.	5	13
2	**Menu Planning:** Explanation of terms, Principles of planning menus, Steps involved in planning menus, Food guide pyramid.	4	10
3	**Infant Foods:** Formulation of weaning foods, Protein energy malnutrition, Formulating diet for preschool going (2-5 years) children.	4	10
4	**Balanced Diet:** Diets during normal life cycle, Nutrition from infancy to adolescence, Nutritional requirements of different age groups, Geriatric nutrition, Nutrition for athletes.	8	15
5	**Therapeutic Diet:** Diet therapy and types of therapeutic diet, Diet for diabetic mellitus, Diet for cardio vascular disease, Diet for gastro intestinal disease.	8	13
6	**Functional Foods:** Concepts for functional foods design, prebiotics & probiotics, nutraceuticals, designer foods.	7	14
7	**Anti-Nutritional Factors in Foods:** Trypsin inhibitors, Phytins, Tannins, Oxalates, Goitrogens, Aflatoxins, Process induced toxins.	5	12
8	**Fermented Foods:** Preparation and maintenance of microbial cultures for food fermentation, Nutritional significance of traditional fermented foods.	8	13

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**17**	**21**	**21**	**21**	**-**

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. Nutritive value of Indian Foods by Gopalan C, Ramshastri BV, Balasubramaniam SC. National Institute of Nutrition, Hyderabad.
2. Handbook of Indigenous Fermented Foods' by K.H. Steinkrus, Marcel Dekkar.
3. Proceedings of Technical Session of IFCON-98' AFTS (I), CFTRI, Mysore.
4. Clinical dietetics and nutrition by FP Antia.
5. Dietetics by Srilaksmi

Course Outcome:

After learning the course the students should be able to:

1. Know the nutritional value of different food groups
2. Identify the nutritional requirements of infants, preschool going children and athletes.
3. Learn the principles of menu planning process and understand and use the concept of food exchange lists.
4. Design therapeutic diets for diseases like diabetes, and CHD
5. Identify anti-nutritional factors present in different foods with their properties and ill effects.

List of Experiments:

1. Preparation of whey based fruit drink
2. Preparation of flavored soy milk
3. Preparation of peanut butter
4. Design and preparation of a diet for athlete or sport person
5. Design and preparation of a diet for children suffering from Protein Energy Malnutrition
6. Preparation of flavored tea
7. Preparation of indigenous dairy product (Rasgulla)
8. Preparation of medicated hard boiled candy
9. Preparation of soy paneer
10. Visit to Amul Mogar plant (Weaning Food Manufacturing Unit)

Design based Problems (DP)/Open Ended Problems:

The topics taught in this subject would be useful to develop insight and application based knowledge among students.

a. Design and formulate a diet for children suffering from Protein Energy Malnutrition
b. Design and prepare a diet for a sport person

Major Equipments

1. Mixer/Grinder
2. Hand refractometer
3. Microwave oven
4. Stainless steel utensils

5. pH meter

List of Open Source Software/learning website:

1. http://nutritiondata.self.com/
2. *www.nutritionvalue.org/*
3. http://www.fda.gov/food/ingredientspackaginglabeling/labelingnutrition/ucm274593.htm
4. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33780/20110208JSP456_Vol1_Chap05_MenuPlanningv5_0webU.pdf
5. *www.fao.org/livestock/agap/frg/ahpp102/102-145.pdf*
6. http://www.researchgate.net/profile/Dr_Muhammad_Nadeem/publication/233816063_An_overview_of_anti-nutritional_factors_in_cereal_grains_with_special_reference_to_wheat-A_review/file/d912f50bd862b6acb1.pdf

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.