

GUJARAT TECHNOLOGICAL UNIVERSITY

Branch Name: Food Processing & Technology (14)

Subject Name: Food Packaging Technology

Subject Code: 2171404

BE Semester: 07

- 1) **Type of Course** Food Processing Technology
 2) **Prerequisite** Nil
 3) **Rational:** To know property of food and packaging material and compatibility of them for enhancing shelf life and quality of food.

4) Teaching Scheme & Examination Scheme

Subject Code	Subject Name	Teaching Scheme(Hours)				Credits	Theory Marks					Tutorial Work/Practical Marks					Total
		Theory	Tutorial	Practical	ESE(E)		PA (M)			Viva (V)		PA(I)					
					Passing Criteria		Other PA	ALA	Passing Criteria	Viva	OEP	Passing Criteria	Other PA	CS	Passing Criteria		
2171404	Food packaging Technology	4	0	2	6	70	23/70	20	10	12/30	20	10	15/30	10	10	10/20	150

ESE = End Semester Examination

PA = Progressive Assessment

ALA = Active Learning Assignments

OEP = Open Ended Problems

CS = Case Studies

5) Learning Objectives

- To know the factors responsible for deteriorating the quality of food and factors to be preserved during storage.
- To know the quality of packaging materials and their compatibility with the process food and environment.
- To know the different types of packaging machines and their fitment in the process line.
- To know the recent advances in food packaging

6) Open Ended Problems

- To select the appropriate packaging material for food product depending on its nature, processing technology and expected shelf life
- To design the food product labels as per legal requirements

7) Content

TOPIC	SUB TOPIC	LECTURES	Module Weightage (%)
Introduction	Important functions of package, packaging materials and various package forms, pouches and tubes.	05	12

	Classification of packaging materials		
Manufacturing Process Outline	Advantages and disadvantages of the following packaging materials: Rigid packaging materials, rigid plastic package, metal container, wooden boxes and crates, sold and corrugated fiber boards cartons, molded paper containers vegetable parchment paper	09	17
Properties, Advantages and Limitations	Properties, advantages and limitations of the following packaging materials: Glass, aluminum, its foil, metal tin containers. Paper and paperboards, laminates and multilayer composition, retortable pouches plastic films- LDPE, and LLDPE, HDPE, PVC, PS, PP, BOPP, nylon lonomers, rubber hydrochloride, natural and PVD, EVA Polyester, cellulose acetate, PET, blister packaging, aseptic Packaging, logistic packaging	11	18
Use of Packaging materials	Packaging materials used for and criteria for selection of packaging materials for the following foods: fruit products, vegetable products, fish and fish products, meat and meat products, beverage carbonated, malted milk products, tea, coffee, alcoholic beverages, confectionery- fat and oil, dairy products frozen vegetables fatty biscuits, cakes, bread, food grains, storage and handling packaging materials	10	17
Packaging Machinery Label and Labeling Packaging design Testing and Identification	Form fill and Seal machine, gravitational and volumetric filling, filler for pasty products, filler for dry products, piston type filling machine Label, types of label, importance of Nutritional Labeling Package design consideration, cushioning materials and their properties Testing and Identification of packaging materials	10	18
Packaging and shelf life of Food Products	Factors controlling shelf life of packaged food products, shelf life estimation in dehydrated food products	03	9
Recent Trends in Food Packaging	Edible packaging, active packaging, Modified atmosphere packaging and RFID indicators	03	9

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
Remembrance	Understanding	Application	Analyze	Evaluate
R	U	A	N	E
Level	Level	Level	Level	Level
21	19	20	18	22

8) Reference Books

1. Fundamentals of Food Packaging By Payne FA
2. Food Packaging by Stanley S
3. Hand Book of Packaging by Indian Institute of Packaging

4. Food Packaging and Preservation by M Mathlouthi, Blackie Academic & professional

5. Handbook of Food Packaging Technology by NIIR, New Delhi

9) Course Outcome

At the end of this module, the student will be able to:

1. Identify deteriorating factors and factors to be preserved for shelf life enhancement of product
2. Selection of packaging material for food and its machine suiting to process line
3. Design of labels

10) List of Practical's

1. Preparation of food product label
2. Determination of GSM for packaging material
3. Determination of packaging material thickness by dial gage
4. Study of corrugated boxes
5. Thermal shock resistance test for glass bottles
6. Determination of Cobb value of paper and paperboard
7. Determination of tensile strength of packaging material
8. Determination of drop resistance for milk pouches
9. Ink adhesion test for milk pouches
10. Determination of paper alkalinity
11. Determination of compression strength of CFB Box.

11) Major Equipments

1. Dial gage micrometer
2. Cobb tester
3. Texture analyzer with tensile probes
4. Drop Tester
5. Compression strength tester
6. Vibration tester

12) List of Open Source Software/learning website

- i) www.iip-in.com
- ii) www.science.gc.ca
- iii) www.pca.org.au/site/education/index.php