



GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING

Subject Code : 3165101

Subject Name : Food Packaging Engineering

WEF Academic Year:	2022-23
Semester:	6
Category of the Course:	Professional Core

Prerequisite: Nil

Rationale: This course includes the study of milk from farm gate all the way through the distribution, storage, manufacturing and applications of dairy products. Practices that affect milk quality and the technology of milk processing and dairy products manufacture are the main emphasis of this course.

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR		Theory		Practical		
			ESE (E)	PA(M)	ESE (V)	PA (I)		
4	0	2	5	70	30	30	20	150

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Introduction: Important functions of package, Packaging Materials and Various PackageForms, Pouches and Tubes. Classification of Packaging Materials.	5	10
2	Manufacturing Process Outline: Advantages and Disadvantages of the following Packaging Materials: RigidPackaging Materials, Rigid Plastic Packages, Metal Containers, WoodenBoxes and Crates, Solid and Corrugated Fibre Boards Cartons, MoldedPaper Containers, Vegetable parchment Paper.	8	15
3	Properties, Advantages and Limitations: Properties, Advantages and Limitations of the Following PackagingMaterials; Glass, Aluminium and Aluminium foil, Metal Tin Containers,Paper and Paperboard, Laminates and Multilayer Composition, RetortablePouches Plastic Films- LDPE and LLDPE, HDPE, PVC, PS, PP, BOPP,Nylon Ionomers, Rubber Hydrochloride Natural and PVD, EVA Polyester,Cellulose Acetate, PET, Blister packaging, Aseptic packaging, LogisticalPackaging.	11	25



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4	Use of Packaging Materials: Packaging Materials Used for and Criteria for Selection of Packaging Materials for the following Foods: Fruit Products, Vegetables Products, Fish and Fish Products, Meat and Meat Products, Beverages Carbonated, Malted Milk Products, Tea coffee, Alcoholic Beverages Confectionery- Fat and Oil, Dairy Products, Frozen Vegetables, Fatty Biscuits, Cakes, Bread, Milk and Milk Products, Food Grains, storage and handling of packaging material.	10	20
5	Packaging Machinery: Form Fill and Seal Machines, Gravitational and Volumetric filling, Filler for pasty products, Filler for dry product, Piston Type filling system. Label and Labelling: Label, Types of labels, Importance of Nutritional Labelling. Packaging Design: Packaging Design Considerations, Cushioning Materials & their properties. Testing & Identification: Testing and Identification of Packaging Materials.	10	20
6	Packaging and Shelf Life of Food Product: Factors controlling shelf life of packaged food product, Shelf-life estimation in dehydrated food product.	3	5
7	Recent Trends In Food Packaging: Edible packaging, Active Packaging, Modified atmosphere packaging, RFID indicators.	3	5

Reference Book:

- Fundamentals of Food packaging by Payne FA
- Food Packaging by Stanley S
- Hand book of packaging by Indian Institute of Packaging
- Food packaging and preservation by M. Mathlouthi. Blackie Academic & Professional



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Suggested Course Practical List:

1. Identification of different types of packaging materials,
2. To perform different destructive and non-destructive tests for glass containers,
3. Vacuum packaging of agricultural produces,
4. Determination of tearing strength of paper board,
5. Measurement of thickness of packaging materials,
6. To perform grease-resistance test in plastic pouches,
7. Determination of bursting strength of packaging material,
8. Determination of water-vapor transmission rate,
9. Shrink wrapping of various horticultural produce,
10. Testing of chemical resistance of packaging materials,
11. Determination of drop test of food package and visit to relevant industries.
12. Visit to relevant industries

List of Laboratory/Learning Resources Required:

Equipment:

- Drop tester
- Shrink wrapping machine
- Thickness gauge

List of Open Source Software/learning website:

- <http://ecoursesonline.iasri.res.in/course/view.php?id=28>

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