GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV04009061

Subject Name: Food Packaging - Lab

w. e. f. Academic Year:	2025-26
Semester:	04
Category of the Course:	Core Course

Prerequisite:	Basic knowledge of Food Packaging
Rationale:	The course focuses on the principles and applications of food packaging to ensure product quality, safety, and extended shelf life. It emphasizes identification and testing of diverse packaging materials, evaluation of mechanical and barrier properties, and hands-on techniques such as vacuum packaging, shrink wrapping, and labeling. Through practical exposure to destructive and non-destructive tests, measurement of material properties, and industry visits, students gain comprehensive knowledge of packaging technology, preparing them for professional roles in food processing, preservation, and product development.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Identify and classify different types of packaging materials used in the food industry.
02	Determine key physical properties of packaging materials, including GSM, thickness, and bursting strength, using standard laboratory methods.
03	Perform and interpret destructive and non-destructive tests, such as drop and grease-resistance tests, for evaluating packaging performance and product safety.
04	Assess the barrier properties of packaging materials by measuring water vapor transmission rate and other relevant quality attributes.
05	Design informative and regulatory-compliant labels for food products and gain exposure through industry visits to real-world packaging operations.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
0	0	2	1	0	0	20	30	50

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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Identification of different types of packaging material Part - I	2	05
2.	Identification of different types of packaging material Part - II	2	05
3.	Study of Corrugated Fiber Board box	2	06
4.	Determining of GSM for given Packaging materials	2	06
5.	To perform different destructive tests for glass containers	2	07
6.	To perform different non-destructive tests for glass containers	2	06
7.	Vacuum packaging of agricultural produces	2	07
8.	Measurement of thickness of packaging materials	2	08
9.	To perform grease-resistance test in plastic pouches	2	07
10.	Determination of cob value in paperboard and corrugated fiber board box	2	07
11.	Determination of bursting strength of packaging material	2	09
12.	Determination of water-vapor transmission rate	2	08
13.	Shrink wrapping of various horticultural produce	2	06
14.	Determination of drop test of food package and visit to relevant industries,	2	06
15.	Designing of label for Food Product.	2	07
	Total	**30**	**100**

Suggested Specification Table with Marks (Practical):

Distribution of Practical Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
11	**11**	**12**	**09**	**07**	**00**

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. Fundamentals of Food Packaging by Payne F.A.
2. Food Packaging by Stanley S.
3. Handbook of Packaging by Indian Institute of Packaging
4. Food Packaging and Preservation by M. Mathlouthi, Blackie Academic & Professional

5. Food Packaging Technology by Y. K. Sharma, Tata McGraw-Hill
6. Food Packaging: Principles and Practice by Gordon L. Robertson
7. Packaging Technology: Fundamentals, Materials and Processes by Mark J. Kirwan

(b) Open-source software and website:

1. DRYMOSIM: Open-source software for modeling food packaging and preservation systems
2. Simulink: For packaging process and mechanical testing simulation (part of MATLAB)
3. PACKTEST: Free online platform for material testing procedures

Websites

1. NPTEL – Food Packaging Technology Courses - https://nptel.ac.in/courses/126/105/126105020/, Offers free video lectures on food packaging materials, testing methods, and industry practices, covering topics such as GSM determination, thickness measurement, burst and drop tests, and label design.
2. Food and Agriculture Organization (FAO) – Food Packaging Guidelines - https://www.fao.org/food-safety/en/ , Comprehensive packaging standards, shelf-life extension methods (vacuum and shrink packaging), and guidelines for quality assurance in agricultural packaging.
3. Indian Institute of Packaging – Research, Manuals, and Testing Protocols - https://www.iip-in.com/ , Provides manuals and research articles on packaging materials identification, destructive/non-destructive testing, barrier property evaluation, and industrial packaging visits.
4. ScienceDirect – Food Packaging Research Papers - https://www.sciencedirect.com/topics/food-science/food-packaging , Peer-reviewed articles on contemporary packaging procedures such as grease-resistance testing, water-vapor transmission rate, and advanced material testing.
5. SpringerLink – Advances in Food Packaging - https://link.springer.com/search?query=food+packaging , Latest research on packaging innovation, practical testing methods, and shelf-life measurement techniques.

Suggested Activities for Students:

1. Gather common food packaging supplies from your house or neighborhood markets and determine the types and have group discussions about their benefits and uses (Packaging Material Exploration).
2. Arrange for visits to research labs and package production facilities to watch real-time shrink-wrapping, vacuum packaging, and industry-standard packing procedures.

3. Group talks and lectures that connect theory to sustainable practices on topics including moisture barrier qualities, grease-resistance tests, and environmentally friendly packaging.
4. Develop innovative and compliant food product labels by combining consumer, marketing, and legal ideas; these projects should result in peer-reviewed presentations.

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