

GUJARAT TECHNOLOGICAL UNIVERSITY

**PACKAGING TECHNOLOGY (58)
PACKAGING PRINCIPLES AND PROCESSES**

SUBJECT CODE: 715803

SEMESTER: I

Type of Course: Regular

Prerequisite: Nil

Rationale:

This course will introduce various concepts of packaging principles and their application in processes and also introduce packaging laws and regulations.

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	Tutorial /Presentation	P		Theory Marks		Practical Marks				
			ESE(E)	PA(M)	PA(V)		PA(I)			
					ESE	OEP	PA	RP		
3	2	2	5	70	30	20	10	10	10	150

Sr. No	Contents	Contact hours	% weightage
1	Objectives of packaging: Maintaining the products quality; Facilitating handling, transportation, and dispensation; Helping to create a brand image, product identity and customers satisfaction; Packaging criteria, appearance, protection against chemical and physical hazards, functions regarding end use performance and machine performance; Cost and cost effectiveness; Disposability.	08	20
2	Package Production: Manufacturing and fabrication processes; Injection, blow, rotational, compression molding, thermoforming, extrusion; Lamination; Vacuum metalizing; Electroless and electrolytic plating; Carton making	08	22
3	Food packaging: Food decay, Methods of food preservations; Aseptic packaging; Modified atmosphere packaging	04	08
4	Packaging Operations and Machinery: Fundamentals of packaging line operations, packaging machinery, process analysis and standards;	05	08
5	Adhesives for packaging, theories of adhesion, adhesive types and selection, Evaluation of adhesive performance	03	08
6	Packaging closures, types of closures, Push fit, Screw threaded, Lug, Crimped-Crown Cork, peelable seal lids etc. Dispensing and metering closures	07	12
7	Packaging Laws and Regulations: INDIAN REGULATORY SYSTEM: Introduction, The Standards of weights and Measures Act (SWMA), Standard Units, Laws, Regulations	10	22

	<p>and Ministries involved, Essential Commodities Act, Agricultural Produce (Grading and Marketing) Act, Prevention of Food Adulteration Act, Codex Standard Act, Export (Quality Control and Inspection) Act, Bureau of Indian Standards</p> <p>INTERNATIONAL LAWS AND VIOLATION OF LAW: Uniform Weights and Measures Law, Uniform Packaging and Labeling Regulation (UPLR), Uniform Unit Pricing Regulation (UPR), Details of Violations, offences, Penalties under various sections, EUREACH Regulations in packaging.</p>		
--	---	--	--

Reference Books

1. Joseph F. Hanlon, Robert J. Kelsey and Hallie Forcinio, “Handbook of Package Engineering, 3rd ed.” CRC Press 1998
2. John R Henry, “Packaging Machinery Handbook: The complete guide to automated packaging machinery including packaging line design Paperback”, CPP 2012
3. Gordon L. Robertson, “Food Packaging: Principles and Practice”, 3rd ed., CRC Press, 2012
4. Walter Soroka, “Fundamentals of Packaging Technology” Institute of Packaging Professionals.
5. Aaron L. Brody and Kenneth S. Marsh, “The Wiley Encyclopedia of Packaging Technology”, 1997
6. G C P Range Rao,” Modern Food Packaging, Packaging Laws and Regulations”, CFTRI Mysore, IIP Publications, 2005
7. The Standards of Weights and Measures act, (1976) & Standards of Weights and Measures (Packaged Commodities) Rules (1977), Rule Book, Govt. Of India.
8. BIS Rule Book, Govt. Of India.

Course Outcome:

After learning this course the student must demonstrate the knowledge and ability to:

1. To familiarize various principles and processes of packaging
2. To comprehend packaging operations and machinery.
3. To understand the environmental issues in packaging and sustainability
4. To understand basic packaging laws and regulations.

List of Experiments:

Case studies based on above syllabus.

Open Ended Problem (OEP):

Students are expected to take up and present case analysis of packaging processes and laws and regulation of different industrial producers/sectors.

Review Presentation (RP):

The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be

generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.