22ELCT306 FOOD PACKAGING TECHNOLOGY

Source: https://www.packworld.com/sites/default/files/field/image/alqueria_roll_infeed.jpg

Hours Per Week :

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Basics of food product characteristics and different packaging materials.

COURSE DESCRIPTION AND OBJECTIVES:

This course deals with basics of packaging systems and different types of packaging materials and determination of strength or thickness of packaging material required. It also helps student to acquaint and equip them with different packaging materials, methods of packaging, packaging technology and packaging machineries used in food industry.

MODULE-1

UNIT-1 **8L+0T+8L=16 Hours**

PACKAGING SYSTEM: Factors affecting shelf life of food material during storage, interactions of spoilage agents with environmental factors as water, oxygen, light, pH, etc. and general principles of control of the spoilage agents; Difference between food infection, food intoxication and allergy. Packaging of foods, requirement, importance and scope, frame work of packaging strategy, environmental considerations, Packaging systems, types: flexible and rigid; retail and bulk; levels of packaging; special solutions and packaging machines, technical packaging systems and data management packaging systems.

UNIT-2 **8L+0T+8L=16 Hours**

PACKAGING MATERIAL: Different types of packaging materials, their key properties and applications, Metal cans, manufacture of two piece and three piece cans, Plastic packaging, different types of polymers used in food packaging and their barrier properties. manufacture of plastic packaging materials, profile extrusion, blown film/ sheet extrusion, blow molding, extrusion blow molding, injection blow molding, stretch blow molding, injection molding. Glass containers, types of glass used in food packaging, manufacture of glass and glass containers, closures for glass containers. Paper and paper board packaging, paper and paper board manufacture process, modification of barrier properties and characteristics of paper/ boards. Relative advantages and disadvantages of different packaging materials; effect of these materials on packed commodities.

PRACTICES:

- Identification of different types of packaging materials.
- Determination of water-vapour transmission rate.
- Shrink wrapping of various horticultural produce.
- Testing of chemical resistance of packaging materials.
- Determination of drop test of food package and visit to relevant industries.

MODULE-2

UNIT-1 **8L+0T+8L=16 Hours**

MODERN PACKAGING SYSTEM: Nutritional labelling on packages, CAS and MAP, shrink and cling packaging, vacuum and gas packaging; active packaging, smart packaging, packaging requirement for raw and processed foods, and their selection of packaging materials, factors affecting the choice of packaging materials, disposal and recycle of packaging waste, printing and labelling, lamination.

SKILLS:

- ✓ *Classify various types of packaging material on the basis of rigidity.*
- ✓ *Select suitable packaging materials for various food products.*
- ✓ *Calculate the shelf life of various food products.*

UNIT-2 **8L+0T+8L=16 Hours**

PACKAGING MATERIAL TESTING: Package testing: Testing methods for flexible materials, rigid materials and semi rigid materials; tests for paper(thickness, bursting strength, breaking length, stiffness, tear resistance, folding endurance, plybond test, surface oil absorption test, etc.), plastic film and laminates (thickness, tensile strength, gloss, haze, burning test to identify polymer, etc.), aluminium foil (thickness, pin holes, etc.), glass containers (visual defects, colour, dimensions, impact strength, etc.), metal containers (pressure test, product compatibility, etc.).

PRACTICES:

- Determination of tensile/ compressive strength of given material/package.
- To perform different destructive and non-destructive tests for glass containers.
- Vacuum packaging of agricultural produces.
- Determination of tearing strength of paper board.
- Measurement of thickness of packaging materials.
- To perform grease-resistance test in plastic pouches.
- Determination of bursting strength of packaging material.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply their knowledge and acquired principles in different packaging strategies by considering several intrinsic factorsand extrinsic factors.	Apply	1	1, 2, 4, 7
2	Analyze the problems of deterioration of food products which take place in current method of preservation and solve it by new and advanced technology.	Analyze	1	1, 2, 4, 6, 7
3	Evaluate the trend and current scenario of different packaging materials which are readily available in industries and develop new technology also.	Evaluate	1 &2	1, 2, 4, 6, 7, 11, 12
4	Apply and develop new package of practices by considering all the limitations of primitive packaging and storage methods.	Apply	1 &2	1, 2, 4, 6, 7, 11, 12
5	Creative technology to identify problem of packaging materials which are already availed and overcome those problems by newand advanced technology.	Create	1 &2	1,2,4,6,7,11,12

TEXT BOOKS:

1. Coles, R., McDowell, D., Kirwan, M .J. Food Packaging Technology. Blackwell Publishing Co, 2001.
2. John, P.J. “A Handbook on Food Packaging” Narendra Publishing House, 1999.
3. Mahadevia, M., Gowramma, R.V. “Food Packaging Materials” Tata McGraw Hill, 2001.

REFERENCE BOOKS:

1. Gosby, N.T. “Food Packaging Materials. Applied Science Publication”, 2008.
2. Robertson, G. L. “Food Packaging and Shelf life: A Practical Guide” Narendra Publishing House, 2001.
3. Robertson, G. L. “Food Packaging: Principles and Practice” Second Edition. Taylor and Francis Publication, 2005.