

FOOD PACKAGING TECHNOLOGY

THEORY

Paper No.	:	7.2
Maximum Marks	:	100
Credits	:	4
Teaching Period	:	4 Theory + 1 Students' Presentation
Teaching Load	:	48 Theory Periods + 12 Presentations / Semester

Objectives:

- To impart comprehensive overview of the scientific and technical aspects of food packaging.
- To instill knowledge on packaging machinery, systems, testing and regulations of packaging.

Unit 1: Introduction to Food Packaging (5 lectures) (Chapter 1,2 Paine & Paine, 1992)

History, Packaging Functions and Requirements- Historical background, importance and scope of food packaging, functions of food packaging and requirements for effective food packaging

Graphics, Package Design, Printing and Labeling- Function of packaging graphics, main printing processes, printing inks, varnishes, adhesives and labels

Unit 2: Food Packaging Materials (15 lectures) (Chapter 6,7,8 Robertson, 2012 and Chapter7 Coles *et al*, 2003)

Paper and paper-based materials, corrugated fiber board (CFB); injection molding, blow molding types of plastics and their properties, co-extrusion, lamination, Biodegradable plastics, edible packaging and bio-composites. Environmental Concerns- recycling and disposal of packaging waste

Metal and Glass packaging- Metals: Tinplate, tinning process, components of tinplate, tin free can (TFC) types of can, metallic films, lacquers, Glass: composition, properties, methods of bottle making, types of closures.

Unit 3: Package Designing for Foods (15 lectures) (Chapter 7,8,9,10,11,13 Paine and Paine, 1992)

Package design for fresh horticultural produce and animal foods, dry and moisture sensitive foods, frozen foods, fats and oils, thermally processed foods and beverages

Unit 4: Testing and Regulatory Aspects of Food Packaging (5 lectures) (Chapter 22 Robertson, 2012)

Testing Procedures for Packaging Materials- thickness, tensile strength, puncture resistance, bursting strength, seal strength, water vapor permeability, CO₂ permeability, oxygen permeability, grease resistance,

Testing Procedures for Packaged Foods - Compatibility and shelf life studies, evaluation of transport worthiness of filled packages. Food Packaging Laws and Regulations

Unit 5 Packaging Machinery and Systems (8 lectures) (Chapter 4 ,Paine & Paine, 1992,Coles *et al*, 2003)

Bottling machines, cartoning systems, seal and shrink packaging machine; form, fill and sealing machine (FFS); vacuum, controlled and modified atmosphere packaging systems; Aseptic packaging systems; Retort packaging, Active and Intelligent packaging systems

Recommended Readings:

1. Robertson GL, Food Packaging – Principles and Practice, CRC Press Taylor and Francis Group, 2012
2. Paine FA and Paine HY, A Handbook of Food Packaging, Blackie Academic and Professional, 1992
3. Coles R, McDowell D, Kirwan MJ Food Packaging Technology. Blackwell, 2003

PRACTICALS IN FOOD PACKAGING

Maximum Marks	:	50
Credit	:	2
Teaching Period	:	4 / Week
Teaching Load	:	48 / Semester

CONTENTS

1. Identification of packaging materials
2. Testing physical/mechanical properties of food packaging material
3. Testing thermal shock resistance of glass
4. Gas/Vacuum packaging of foods
5. Determination of water vapor transmission rate of packaging material
6. Testing sealing strength integrity of packaging materials
7. Determination of porosity of tin plate.
8. Testing of packaged foods-cut out analysis

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1. Robertson GL, Food Packaging – Principles and Practice, CRC Press Taylor and Francis Group, 2012
2. Paine FA and Paine HY, A Handbook of Food Packaging, Blackie Academic and Professional, 1992
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