

**CH558 FOOD PACKAGING TECHNOLOGY****UNIT-I**

Introduction to principals of food packaging, Types of packaging. Functions of packaging; Type of packaging materials; Selection of packaging material for different foods. Selective properties of packaging film; Methods of packaging and packaging equipment.

Mechanical strength of different packaging materials; Printing of packages . Barcodes & other marking; Interactions between packaging material and foods; Environmental and cost consideration in selecting packaging materials.

**UNIT-II**

Testing of packaging; Rigid and semi rigid containers; Flexible containers; Sealing equipment; Labelling; Aseptic and shrink packaging; Secondary and transport packaging. Food packaging and law, shelf life testing, modern and traditional packaging material, physical and chemical properties, production, storage and recycling of packaging materials, regulation and equipment analysis of various existing packaging system and standards. Active and intelligent packaging techniques: Active packaging techniques, intelligent packaging techniques, Current use of novel packaging techniques, Consumers and novel packaging. Oxygen, ethylene and other scavengers: Oxygen scavenging technology, Selecting the right type of oxygen scavenger, Ethylene scavenging technology, Carbon dioxide and other scavengers. Antimicrobial food packaging: Antimicrobial agents, Constructing an antimicrobial packaging system, Factors affecting the effectiveness of antimicrobial packaging

**UNIT-III**

Non-migrating bioactive polymers (NMBP) in Food Packaging: Advantages of NMBP, Inherently Bioactive synthetic polymers: types and application, Polymers with immobilized bioactive compounds, Applications of polymers with immobilized bioactive compounds.

Time- temperature indicators (TTIs): Defining and classifying TTIs, Requirements for TTIs, The development of TTIs, Maximising the effectiveness of TTIs, Using TTIs to monitor shelf-life during distribution. The use of freshness indicator in packaging: Compounds indicating the quality of packaged food products, Freshness indicators, Pathogen indicators Other methods for spoilage detection. Packaging-flavour interactions: Factors affecting flavour absorption, The role of the food matrix, The role of differing packaging materials, Flavour modification and sensory quality. Moisture regulation: Silica gel, Clay, Molecular sieve, Humectant salts, Irreversible adsorption.

**UNIT-IV**

Developments in modified atmosphere packaging (MAP): Novel MAP gases, Testing novel MAP applications, Applying high oxygen MAP. Recycling packaging materials: The recyclability of packaging plastics, Improving the recyclability of plastics packaging, Testing the safety and quality of recycled material, using recycled plastics in packaging. Green Plastics for food packaging: The problem of plastic packaging waste, The range of biopolymers, Developing novel biodegradable materials.

## **UNIT-V**

Integrating intelligent packaging, storage and distribution: The supply chain for perishable foods, The role of packaging in the supply chain, Creating integrated packaging, storage and distribution: alarm systems and TTIs. Testing consumer responses to new packaging concepts: New packaging techniques and the consumer, Methods for testing consumer responses, Consumer attitudes towards active and intelligent packaging.

### **Text Books:**

1. A handbook of Food Packaging, F A Paine and H Y Paine, Blackie & Sons Ltd., Glasgow, UK, (1983).
2. Modern Food Packaging, Published by Indian Institute of Packaging, Mumbai (1998).
3. A Textbook of Food Science and Technology, ICAR, New Delhi (2001).

### **References:**

1. Food Packaging and Preservation (theory & practice) by M.Mathlouthi Elsevier Applied science publisher, London and New York.
2. Plastics in packaging by forwarded by H.B Ajmera & M.R Subramaniam – Indian institute of packaging. Published by A.P.Vaidya, Secretary IIP, E2, MIDC, Industrial Area (Andheri (East), Bombay-400093.
3. Food and Packaging Interactions by Joseph H. Hotchkiss, (ACS symposium series - 365, April 5-10, 1987, American chemical society, Washington DC, 1988.)
4. Packaging foods with plastics by winter A. Jenkins & James P Harrington – Technomic publishing co. Inc, Lancaster. Basel.
5. Flexible food packaging (Question & Answers) by Arthur Hirsch VNB – Van Nostrand Reinhold, New York (An AVI Book), ISBN 0-442-00609-8.