PFE 321 FOOD PACKAGING TECHNOLOGY

Cr. Hrs. 3 (2 + 1)
L T P
Credit 2 0 1
Hours 2 0 2

Course Outcome:

At the end of the course, the student will be able to acquaint with various food packaging materials, various aspects of packaging methods and technology.

Unit-I

Factors affecting shelf life of food material during storage, 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.

Unit-II

Different types of packaging materials, their key properties and applications, metal cans, plastic packaging, different types of polymers used in food packaging and their barrier properties. Manufacture of plastic packaging materials; glass containers, types of glass used in food packaging, manufacture of glass and glass containers, closures for glass containers. Paper and paper board packaging, modification of barrier properties and characteristics of paper/ boards.

Unit-III

Nutritional labeling on packages, CAP and MAP, shrink and cling packaging, vacuum and gas packaging; active packaging, factors affecting the choice of packaging materials, disposal and recycle of packaging waste, printing and labeling; lamination.

Unit-IV

Package testing, testing methods for flexible materials, rigid materials and semi rigid materials; Tests for paper, glass containers, metal containers.

Practical

1. Identification of different types of packaging materials.
2. Determination of tensile / compressive strength of given material/package.
3. Vacuum packaging of agricultural produces.
4. Determination of tearing strength of paper board.
5. Measurement of thickness of packaging materials.
6. To perform grease-resistance test in plastic pouches.
7. Determination of bursting strength of packaging material.
8. Determination of water-vapour transmission rate.
9. Shrink wrapping of various horticultural produce.
10. Testing of chemical resistance of packaging materials.
11. Determination of drop test of food package and visit to relevant industries.

Suggested Readings

1. Coles R., McDowell D. and Kirwan, M.J. 2003. Food Packaging Technology, Blackwell Publishing Co.
2. Gosby, N.T. 2001. Food Packaging Materials, Applied Science Publication
3. John, P.J. 2008. A Handbook on Food Packaging, Narendra Publishing House,
4. Mahadevia, M., Gowramma, R.V. 2007. Food Packaging Materials, Tata McGraw Hill
5. Robertson, G. L. 2001. Food Packaging and Shelf life: A Practical Guide,Narendra Publishing House.
6. Robertson, G. L. 2005. Food Packaging: Principles and Practice, Second Edition, Taylor and
7. Francis Pub.

PFE 322 DAIRY AND FOOD ENGINEERING

Cr. Hrs. 3 (2 + 1)
L T P
Credit 2 0 1
Hours 2 0 2

Course Outcome:

At the end of the course, the student will be acquainted with various dairy engineering operations such as homogenization, pasteurization, thermal processing, evaporations, freezing and drying of milk.

Unit-I

Deterioration in food products and their controls, physical, chemical and biological methods of food preservation. Dairy development in India, engineering and chemical properties of milk and milk products.

Unit-II

Principles and equipment related to receiving of milk, pasteurization, sterilization, homogenization, centrifugation and cream separation. Filling and packaging of milk and milk products. Preparation methods and equipment for manufacture of butter.

Unit-III

Principles of operation and equipment for thermal processing, canning, aseptic processing. Evaporation of food products: principle, types of evaporators, steam economy, multiple effect evaporation, vapour recompression.

Unit-IV

Drying of liquid and perishable foods: principles of drying, spray drying, drum drying, freeze drying, Filtration: principle, types of filters; Membrane separation, water activity and MSI.

Practical

1. Study of pasteurizers.
2. Study of sterilizers.
3. Study of homogenizers.
4. Study of separators.
5. Study of butter churns.
6. Study of evaporators.
7. Study of milk dryers.
8. Study of freezers.
9. Study of filtration.
10. Visit to multi-product dairy plant, Estimation of steam requirements.
11. Visit to Food industry.

Suggested Readings

1. Ahmed, T. 1997. Dairy Plant Engineering and Management, 4th Ed. Kitab Mahal.
2. McCabe, W.L. and Smith, J. C. 1999. Unit Operations of Chemical Engineering, McGraw Hill.
3. Rao, D.G. Fundamentals of Food Engineering, PHI learning Pvt. Ltd., New Delhi.
4. Singh, R.P. and Heldman, D.R. 1993. Introduction to Food Engineering, Academic Press.
5. Toledo, R. T. 1997. Fundamentals of Food Process Engineering, CBS Publisher.