FOOD ENGINEERING

THEORY

Paper No. : 6.1
Maximum Marks : 100
Credits : 5
Teaching Period : 4 Theory + 1Presentation
Teaching Load : 48 Theory Periods + 12 Presentations / Semester

Objectives:

1) To understand the principles of Unit operations
2) To acquaint with fundamentals of food engineering and its process
3) To understand the basics of designing of food systems

CONTENT

UNIT 1 – Heat and Mass Transfer (Chapter.1, 4, Singh and Heldman 2003) (Lectures-15)

- Concept of Unit operation,
- Units and dimensions, Unit conversions, dimensional analysis
- Mass and Energy Balance.
- Thermal Properties of Food
- Systems for heating and cooling food products
- Modes of heat transfer
- Application of steady state heat transfer- estimation of conductive heat transfer cofficient, convective heat transfer coefficient, overall heat transfer coefficient and,design of tubular heat exchanger.
- Fick's Law of Diffusion
- Membrane separation systems-Electrodialysis system , Reverse Osmosis Membrane System, and Ultrafiltration Membrane System
- Membrane devices used for RO and UF: Plate and Frame, Tubular, Spiral wound and hollow fiber devices

PRACTICALS IN FOOD ENGINEERING

Maximum Marks : 50
Teaching Period : 4
Teaching Load : 48 / Semester

CONTENTS

1. To study colligative properties of food
2. Determination of drying characteristics
3. Determination of viscosity of Newtonian and Non Newtonian fluids

4. Study of effect of temperature on viscosity
5. Study of evaporation process
6. Freezing time calculations
7. Psychrometrics- use and application
8. Plant layout and design

Recommended Readings:

1. Rao DG. Fundamentals of Food Engineering. PHI learning private ltd.2010
2. Singh RP and Heldman DR. Introduction to Food Engineering. Academic press1993, 2003, 2009 2nd, 3rd and 4th edition.
3. Toledo. Fundamentals of Food Process Engineering,Amazon publishers 3rd Edition 2000