

**ADIKAVI NANNAYA UNIVERSITY**  
**CBCS/SEMESTER SYSTEM**  
**IV SEMESTER : B.Sc FOOD TECHNOLOGY**  
**(w.e.from 2015-16 admitted batch)**  
**UNIT OPERATIONS IN FOOD PROCESSING - 2**

**Unit -I:**

Distillation – stage distillation, steam, vacuum and batch distillation. Mixing – mixing of solids, liquids, pastes. Blending, emulsification, mixing index, Physical, thermal, electrical and rheological properties.

**Unit-II:**

Drying and Dehydration – Moisture content, free moisture, bound moisture- Thin layer drying, batch drying, Equilibrium moisture content, Hysteresis, Drying curves, Constant - rate period, Falling - rate period– water activity - Psychrometry - terms, chart and application.

**Unit -III:**

Types of dryers: tray dryer, tunnel dryer, LSU dryer, freeze dryer, osmotic dehydration, foam mat drying, their working principles and applications in food industry, extrusion cooking.

**Unit-IV:**

Introduction to heat processing - Blanching, Pasteurization, Sterilization, Interaction of Heat Energy and Food Components - Introduction to Reaction Kinetics, Temperature Dependence of Kinetics, Thermal Destruction of microorganisms, Thermal Destruction of Enzymes,

**Unit-V:**

Concentration – freeze concentration – freezing and storage of frozen products – low temperature preservation, irradiation of food products – microwave heating, dielectric heating of foods, principles and applications in industry.

**Practicals:**

**Semester-II**

1. Determination mixing index of a feed mixer.
2. Determination of thermal death time.
3. Experiments on sterilization in retorts.
4. Experiments on tray dryer.
5. Experiments on osmotic drying.
6. Experiments on extrusion cooking.
7. Experiments on freezing of food materials.
8. Experiments on freeze dryer.
9. Determination of bulk density and porosity of grains.
10. Determination of size and angle of repose of grains.
11. Determination of specific heat of grains.
12. Visit to an industry (extruder).

**Books for Reference:**

1. Chakravarthy A, *Post Harvest Technology of Cereals, Pulses and Oilseeds*, Oxford and IBH Publications Company Limited, Calcutta, 1988.
2. Charm S.E, *Fundamentals of Food Engineering*, The AVI Publishing Company, USA, 1971.
3. Dennis R.H, *Food Process Engineering*, The AVI Publishing Company, 1971.
4. Earle R.L, *Unit Operations in Food Processing*, Pergamaon press, New Delhi, 1983.
5. Mc Cabe and Smith J.C, *Unit Operations of Chemical Engineering*, Tata Mc Graw Hill Publishing Book Company, New Delhi, 1993.
6. Geankoplis CJ, Allyn & Bacon Inc. Newton, Massachusetts, *Transport Process & Unit Operations*, 1978.
7. Sahay K.M. & Singh K.K, *Unit Operations of Agricultural Processing*, Vikas Publication House, New Delhi.