

## **FST-203, Food Processing & Preservation 3(2-1)**

### **Educational Objectives:**

The aim of this subject is to provide students with an understanding of the science and technology associated with the processing of materials of plant and animal origin into food and food products and their preservation by traditional and modern techniques. An integrated presentation embodying chemical, microbiological, nutritional and engineering aspects will be adopted. Practical exercises, demonstrations and site visits will provide experience in commonly applied technologies.

### **Course Outcomes:**

1. On completion of this subject students should be able to:
2. Demonstrate an understanding of the principles and application of food processing and preservation technologies
3. Describe the technologies used to effect preservation
4. Describe the manufacture of a variety of foods and food products, including formulated and specialty foods as well as those within the main commodity groups
5. Understand the role of fractionation and manipulation of food components to produce new products or ingredients
6. Understand and evaluate the implications of processing and preservation methodologies on the physical, chemical, microbiological and nutritional quality of foods
7. Demonstrate an understanding of the basic unit and factory operations used in food processing
8. Evaluate processing technologies for their appropriate application

### **Course Contents:**

- Postharvest handling and preparation of foods for food processing:
- Introduction, properties of raw materials, handling, storage and transportation of raw materials. Preparatory operations: cleaning, sorting, grading, size reduction, sulphiting.
- Thermal processing: principles & application – blanching, pasteurization, sterilization, HTST, commercial sterilization, UHT, canning.
- Low temperature preservation: Principles & application - refrigeration, chill injury, controlled atmospheric storage, modified atmosphere packaging. Freezing: methods, changes in foods, freeze burn.

- Dehydration & drying - significance: concentration and condensation. Drying systems: solar drying, hot air drying, drum drying, spray drying.
- Chemical preservation: different chemical additives and their mode of action.
- Fermentation technology: principles, objectives, types - alcoholic, acetic and lactic fermentations. Fermented foods: bread, wine, vinegar, yoghurt, sausages, pickles. Food irradiation: principles, applications, safety aspect, effect on food properties

**Practical:**

- Preparatory operation in food processing and preservation.
- Canning of selected fruits and vegetables.
- Cold storage, freezing and dehydration of fruits and vegetables.
- Use of chemicals in preservation of food products. Preparation of fermented food products.

**Recommended Books:**

1. Da Wen Sun, 2<sup>nd</sup> Edition, 2014, Emerging technologies for food processing, Academic Press, Elsevier
2. J. M. Bouvier, Oswaldo H. Campanella, 2014, Extrusion processing technology- Food and nonfood biomaterials. Wiley Blackwell
3. Suvendu Bhattacharya, 2014, Conventional and advanced food processing technologies, Wiley
4. James G. Brennan, Alistor S. Grandison, 2<sup>nd</sup> Edition, 2012, Food processing handbook, Wiley VCH
5. Bhat, R., Alias A.K. and Paliyat, G. 2012. Progress in food preservation. John Wiley and Sons Ltd., USA.