

FST-315, Beverage Technology 3 (2-1)

Educational objectives:

The course is aimed to familiarize the students with various aspects of beverage technology. The preparation of various hot and cold beverages, the problems encountered in these products. In addition, making students learn the quality standards and quality control strategies in this segment of food industry.

Course outcomes:

On completion of this subject students should be able to:

1. Demonstrate an understanding of the principles and application of beverage processing technologies
2. Describe the manufacture of a variety of beverage products
3. Understand and evaluate the implications of processing methodologies on the physical, chemical, microbiological and nutritional quality of beverages
4. Demonstrate an understanding of the basic unit and factory operations used in food processing

Theory:

- Beverage industry in Pakistan. Beverages: classification still, carbonated, alcoholic.
- Beverage ingredients: water - sources, quality, purification methods;
- Sweeteners sugars, artificial sweeteners;
- Additives: colours, flavours, preservatives, acidulants, stabilizers, carbon dioxide.
- Carbonated beverages: bottle washing, syrup room operations, carbonation, filling, capping. Fruit based beverages: fruit pulps, juice concentrate, fruit juices, ready to serve juices, nectar, cordial, squash, syrup, barley water, energy drinks, traditional beverages, synthetic, low calorie, fruit flavoured drinks. Fermented beverages: tea, coffee.
- Bottled water: manufacture.
- Quality control,
- Water microbiology,
- Drinking water standards (WHO, PSQCA), plant sanitation.
- CAC/PSQCA standards for carbonated and non-carbonated beverages.

Practical:

- Water sampling procedures, determination of water pH, Electrical conductivity, TDS (total dissolved solids), water total hardness, Ca hardness, Mg hardness, Water alkalinity, M-alkalinity, P-alkalinity.
- Formulation and preparation of carbonated beverages.
- Preparation and preservation of fruit pulps and juices.
- Preparation of juice concentrates.
- Use of low calorie sweeteners for development of diet beverages.
- Manufacture of syrups, squashes, traditional beverages synthetic and powder beverages. Analysis of beverages: chemical, microbiological, sensory.
- Water treatment. Visit to beverage industries.

Recommended Books:

1. Marian Garcia Martinez, 2013, Open innovation in food and beverage industry, Wood Head Publishing
2. Hui, Y.H. and Ozgul-Evranuz, E. 2012. Handbook of plant-based fermented food and beverage technology. CRC press, Taylor & Fancis Group, USA.
3. Alexandru Grumezescu, Alina Maria Holban, 1st Edition, 2018, Production and Management of Beverages, Elsevier.
4. Ingrid Aguilo-Aguayo, Lucia Plaza, 2017, Innovative technologies in beverage processing, John Wiley and Sons.