Syllabus:
As per New syllabus

Course No: **FT-111** Course Title: **Food Science and Processing**
Credits: **2(1+1)** Semester : **I**

Theory
UNIT I
Definition: Food and nutrition; Food production and consumption trends in India; Major deficiencies of calories, proteins, vitamins and micronutrients; Food groups and concept ofbalanced diet; RDA.
UNIT II
Causes of food spoilage; Principles of processing and preservation of food by heat, low temperature, drying and dehydration, chemicals and fermentation; Preservation through ultraviolet and ionizing radiations.
UNIT III
Post-harvest handling and technology of fruits, vegetables, cereals, oilseeds, milk, meat and poultry; Food safety, adulteration and food laws; Status of food industry in India.
Practical
Physical and chemical quality assessment of cereals, fruits, vegetables, egg, meat and poultry; Value added products from cereals, millets, fruits, vegetables, milk, egg and meat; Visit to local processing units.

As per old syllabus

FB 355:Technological Applications in Food Processing 1+1=2
Theory
Recent trends in food processing. Techniques and applications of immobilized enzymes in food industry. Applications of glucose oxidase, catalase and pectinase in food processing. Single cell proteins for human food consumption. Biotechnology for natural and artificial flavor and fragrance production.Microbial biotechnology for food flavour production, oils andfats, Molecular High Intensity Low Calorie sweeteners. Essential oils. Sources and productionof vitamins under controlled conditions. Safety issues related processed foods, parealization,nanotechnology, hardle technology, bio-preservation/ Natural preservation. High electriclight pulse technology. Aseptic packaging/ vaccum packaging, biodegradable plastics,extrusion cooking.
Practicals:
Preparation of extruded products, preparation of pickles, preservation of food using organic acids, production of â-carotene/citric acid, SCP production, bioflavours/ biocolor.

FB 366: Post Harvest Biotechnology of Horticultural Crops 2+1=3
Theory:
Importance of post harvest loss management. Pre- and Post-harvest factors affecting shelf life of Horticultural crops. Post harvest molecular biology- ripening (role of ethylene, climacteric vs. non-climatric fruits), fruit softening (Pectinase and polygalacturonases), flavor fragrance and senescence. Genetic engineering plants for delayed ripening and better shelf life. Packing techniques- grading, containers, cushioning, vacuum packing, canning, bottling, freezing, dehydration, drying, UV and Ionizing radiations. Principles of preservation by heat, low

temperature, chemicals and fermentation. Preservatives and colours permitted and prohibited in India. Storage techniques- Zero Energy Cold Storage Chambers and On Farm Storage facilities. Microbial contaminants and post-harvest pathology. Export Quality Standards. Biotechnology for recycling Horticultural waste as manures and livestock feed. Phytosanitation, HACCP, GM fruits and vegetables.

Practical:

Maturity standards of some selected fruits and vegetables. Ethylene assay. Determination of Physiological loss of weight, TSS, total sugars, acidity, pigments and ascorbic acid contents inselected horticultural crops. Packing and storage techniques. Quality standards for exports. Visit to pre-cooling and packing unit. Grading for international market and national quality code standards. Role of UV in preservation of food.

FB367 : Food and Nutrition Security of GM Food crops 1+1

Theory:

International aspects of the quality and safety of Foods derived from modern Biotechnology, Application of ELISA for detection of Toxins in food, Biosensors for food quality Assessment, Malnutrition, consequences, causes, prevention and control. Applied community nutrition. Food safety and food faddism. safety testing for toxicity, allergenicity , anti nutritional effects Native toxins and toxins produce during storage, health hazards.

Practicals:

Quantitation of toxins by various methods, Biofilm production, Antimicrobial activity and ELISA for toxins and viruses,

FB 479 FRUIT AND VEGETABLE BIOTECHNOLOGY 2+2

Theory:

Introduction, the nutritional importance of fruits and vegetables. Strategies for nutritional enhancement: The application of traditional breeding methods for selection of varieties, a reduction in the content of anti-nutritional factors, the use of genetic manipulation to introduce new traits. Nutritional health benefits through biotechnology. Relationship of structure to nutritional quality (Bioavailability). Nutritional enhancement versus food fortification. Constraints on innovation, further trends in food biotechnology. Food safety. Case studies to improve Nutritional quality and shelf life of fruits and vegetables- e.g.Potato, tomato, Grape etc. Case studies of grape, tomato, papaya and other fruits and vegetables,

Practicals:

1. Biochemical analysis of nutritionally important fruits and vegetables.
2. DNA isolation.
3. DNA fingerprinting of fruits and vegetables.
4. Identification of novel gene(s) related to nutritional character by using various markers.
5. MAS for the quality characters.

FB 4710 BREWING TECHNOLOGY 1+3

Theory:

Introduction, History of brewing, Malts, Mash tun adjucts and brewing liquour. Milling and mashing in, Mashing and wort separation systems. The hop-boil and copper adjucts, wort clarification, cooling and aeration. Fermentation process development, scale of up process.

Practicals:

1. Biochemical analysis of nutritionally important fruits and vegetables used in brewing.

2. Media preparation and instrument required for brewing.
3. Preparation of mother culture and starter culture for alcohol production.
4. Preparation of Beer / alcohol.
5. Contamination of beer during processing and effect of contaminants on quality of beer.
6. Sensory evaluation of Beer.
7. Removal of protein from beer by hydrolysis, precipitation and adsorption method.
8. Major problems in Beer production.
9. Defects in Beer
10. Studies on factors affecting quality of beer.

FB 4711 WINE TECHNOLOGY 1+3

Theory:

Introduction, Grape cultivars and wine types: Vitis vinifere cultivars, white cultivars, red cultivars, Advance techniques in production, Genetic engineering in wine grapes, clonal selection and somaclonal selection, Biotechnology in Viti culture, Genetic engineering for Yeast fermentations, Ideal Yeast; Yeast breeding and wine quality. Wine as a functional food, Factors affecting during storage or aging of wine.

Practicals:

1. White wine production and recommended varieties.
2. Red wine production and recommended varieties.
3. Production of wines other than grapes.
4. Techniques of testing wine:- Selection of glass, serving temperature, Design of room for wine testing
5. Timing of testing wine, test the wine on the basis of senses (Vision, small / aroma and palate structure).
6. Sensory evaluation and score card:- Rose worthly score card, Devis score card and sparkling wine score card.
7. Visit to the winery
8. Production of wines on lab scale / industrial scale.
9. Tartarate and bitartarate stability test / cold stability test
10. Determination of acetaldehyde / phenol content of wine.
11. Spoilage and Adulteration of wine.
12. Studies on factors affecting quality of wine.