

## **II Year B.Tech Food Technology II - Semester**

### **PRINCIPLES OF FOOD PRESERVATION**

#### **UNIT – I**

Scope - Principles of Food Science and Technology - Introduction - Definitions of Food, Food Science and Technology - introduction to other relevant terms pertaining to food technology. Food Classification - Basic four, Basic five (ICMR), Basic seven - Perishables – Semi perishables and Non perishables. Food Spoilage- types- factors affecting spoilage - Definition of Food Spoilage - Major types of food spoilage including micro biological - Bio-chemical, physical and enzymatic spoilage (Bio-chemical spoilage). Spoilage by insects, parasites and rodents - Mechanical spoilage (Physical spoilage) - Chemical spoilage. Factors affecting food spoilage - Extrinsic: Temperature- RH- O<sub>2</sub>, CO<sub>2</sub>; Intrinsic - pH – Moisture content- aw. Chemical nature - oxidation reduction potential - physical structure - available nutrients - presence of anti microbial agents.

#### **UNIT – II**

General Principles of Food Preservation - Physical Methods - Chemical Methods-Fermentation - Other Methods. Traditional methods of storage and preservation - Grain storage structures - Puri - Kotlu - Gade / Gumi - Jadi / Kunda - Pathara - Basta / Sanchi. Different processing methods of food - Objectives of Cooking - Cooking methods – Moist heat - dry heat and combination method. Boiling - Simmering - Poaching - Stewing - Blanching - Steaming - Microwave cooking- Baking. Preservation by salt -Types of salts used- uses of salt- Brine - preparation of brines - Composition of Brines used in canning-pickling-advantages-disadvantages. Preservation by sugar - preparation of syrups for canning - measuring strength of syrups- Pearson square method.

#### **UNIT – III**

Preservation by Thermal Processing - Blanching - Pasteurization-types-equipment - Sterilization. Preservation by canning - different unit operations involved in canning-equipment used in canning- types of canning containers. Use of low temperatures - Types of cold preservation - Chill storage - Procedure of low Temperature storage - types of freezing equipment used. Various changes occurring during freezing and thawing - methods of food freezing – Quick fast freezing and slow freezing-factors affecting storage

#### **UNIT – IV**

Drying / Dehydration - Definition of drying - Advantages of dried foods - Sun drying - Mechanical dehydration - Direct heated driers - Indirect heated driers - Cabinet driers - Tunnel drier - Drum Drier - Fluidized Bed Drier - Spray Drier. Factors affecting dehydration of food-Dehydration - methods of dehydration-advantages disadvantages of dehydration. Changes in constituents of Food materials - Shrinkage, case hardening - Thermo plasticities - Reconstitution properties - Thin layer drying – Deep Bed Drying. Moisture Content expression - Types of moisture definition - Bound moisture – Unbound moisture - Free moisture. Preservation by concentration - What is concentration - Methods of concentration – Film evaporators - Falling evaporators. Flash Evaporator - Freeze Concentration - Ultra Filtration and reverse osmosis. Preservation by radiation - Food irradiation - What is food irradiation - Forms of energy - Ionizing radiation and sources - Units of radiation - Effects of radiation, Irradiation doses for treating foods - Mechanism underlying Irradiation-Advantages-Disadvantages

#### **UNIT – V**

Preservation by Chemicals - Introduction - Class I Preservatives - Class II Preservatives - Safe limits of usage. Preservation by mould inhibitors, antibiotics, acidulants - Antioxidants - Antibiotics – Mould inhibitors - Parabens - Epoxides - Benzoic acid - Propionic Acid. Preservation by fermentation - Definition - Some industrial fermentation in food industries. Recent methods in preservation : Pulsed electric field processing - principle - equipment - Mechanism - effect on quality - advantages - disadvantages. High pressure processing - principle - equipment - Mechanism - effect on quality – advantages - disadvantages. Processing using ultrasound - Principle - equipment - mechanism - effect on food quality. Dielectric and Ohmic heating - Principle - equipment - mechanism - effect on food quality. Infrared heating - Theory - equipments - effect on food quality

#### **References**

1. Giridhar Lal, Siddappa G.S and Tandon G.L. Preservation of Fruits and Vegetables. ICAR, New Delhi.
2. Norman N. Potter .Text Book of Food Science.CBS publishers, New Delhi.
3. Joseph Hotchis.F.Food Processing Technology .CRC publishers.

4. Fellows. J.P. Food Processing Technology, Principles and Practices II Edition. Wood Head Publishing, Cambridge.
5. Vijayakhadar. Text Book on Food Storage and Preservation. Kalyani publishers, Delhi.
6. Srilakshmi. B. Food Science. New Age Publishers, New Delhi.
7. Shakuntala manay and Shadakshar Swamy. Foods, Facts and Principles. New Age Publishers, New Delhi.