

BTPE3003 FOOD PROCESS ENGINEERING(3-0-0)

Module-I: (08 hours)

Fundamentals of Food Processing: Overview of Food Processing, Objectives and importance Classification of Food and Food Constituents Physical, Chemical, and Biochemical Changes During Processing Food Spoilage and Microbial Contamination Preliminary Processing Operations: Cleaning, sorting, grading.

Module-II: (08 hours)

Thermal and Non-Thermal Food Preservation Techniques: Thermal Processing: Pasteurization, sterilization, blanching, Refrigeration and Freezing: Principles, cryogenic freezing, Drying and Dehydration: Techniques, freeze-drying, spray drying, Non-thermal Methods: High pressure processing, pulsed electric field, irradiation, Hurdle Technology and Minimal Processing

Module-III: (08 hours)

Food Fermentation and Bioprocessing: Principles of Fermentation in Food: Lactic acid, alcoholic, acetic acid fermentations, Fermented Food Products: Yogurt, cheese, vinegar, fermented vegetables Probiotics and Prebiotics: Functional foods, Role of Enzymes in Food Processing, Industrial Fermentation Equipment and Bioreactors

Module-IV: (08 hours)

Food Packaging and Storage Food Packaging Materials: Plastics, paper, metal, biodegradable options, Packaging Techniques: Vacuum, MAP, active packaging, Storage and Shelf Life: Moisture, oxygen, light, and temperature effects, Transportation and Distribution Considerations, Smart Packaging and IoT in Food Safety Monitoring.

Module-V: (08 hours)

Quality, Safety, and Regulatory Aspects: Quality Assurance and Control in Food Processing, Food Safety Management Systems: HACCP, ISO 22000, Food Laws and Regulations: FSSAI, Codex Alimentarius, AGMARK, BIS, Food Additives and Contaminants: Permissible limits and detection, Ethical, Environmental, and Societal Issues in Food Technology.

Course outcomes (Cos)

- CO1: Understand principles and techniques of food processing and preservation.
- CO2: Analyze various thermal and non-thermal methods for maintaining food quality.
- CO3: Apply biotechnology and fermentation technologies for food product development.
- CO4: Evaluate packaging and storage systems for maintaining food safety and shelf life.
- CO5: Understand food quality control, regulations, and safety management practices.

Books:

1. Ramaswamy H. & Marcotte M., Food Processing: Principles and Applications, CRC Press
2. Fellows, P., Food Processing Technology: Principles and Practice, Woodhead Publishing
3. Potter N. & Hotchkiss J.H., Food Science, Springer
4. Norman N. Potter, Food Science, Springer
5. FSSAI Guidelines and Codex Alimentarius Online