



THERMAL PROCESSING OF FOODS

PROF. R. ANANDALAKSHMI

Department of Chemical Engineering
IIT Guwahati

INTENDED AUDIENCE : The target audience for this course is

- BTech/MSc/MTech/PhD students or faculties from reputed academic and technical institutions interested in acquiring knowledge of thermal food processing technologies
- Those who are pursuing a career as a chemical engineer or food engineer or biotechnologist designing thermal processing technologies for food processing or working with thermal processing of foods
- Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories working in the area of thermal food processing

INDUSTRY SUPPORT : Food Corporation of India, Department of food & Public Distribution, India Central Food Technological Research Institute, Institute of Food Security and Central Warehousing Corporation. Some of the private sectors are Amul, Perfetti Van Melle India Pvt. Ltd., Parley Products Ltd., PepsiCo India Ltd. etc

COURSE OUTLINE :

The Food and Agriculture Organization (FAO) of the United Nations (UN) issued a report on the importance and complexities associated with feeding the projected 9.1 billion world population in 2050. Sustainable production of safe and nutritious foods, development of foods that have a long shelf life and foods that are either ready-to-eat or easy to are of greater importance towards meeting this goal. Understanding "Food Engineering" and "Thermal Processing of Foods" serves as basic requirement means of meeting this goal.

ABOUT INSTRUCTOR :

Prof. R. Anandalakshmi is an Associate Professor in the Department of Chemical Engineering, Indian Institute of Technology, Guwahati. Her research interests are in the area of Computational Heat Transfer and Fluid Flow, Process Modeling and Simulation, Solar Thermal Energy Conversion, Energy Efficient Design of Thermal Systems, Microwave Assisted Food and Material Processing, Food Packaging and Preservation, Refrigeration and Air-conditioning Systems.

COURSE PLAN :

Week 1: Food microbiology: microbial growth and concerns in various foods, Blanching, Pasteurization, Ultra-pasteurization, Hot fill and UHT

Week 2: Thermal processing equipment, Milk pasteurization, Canning operations

Week 3: Temperature distribution and heat penetration, Kinetics of reactions, F value and process requirements

Week 4: Quality considerations and process optimization, Shelf life studies, Validation of heat processes

Week 5: Fundamentals of aseptic processing, Aseptic equipment design, Aseptic process design

Week 6: Microwave and radio frequency heating, Ohmic heating, Overview of non-thermal processing technologies

Week 7: Advanced separation processes high pressure, dialysis ultrafiltration and reverse osmosis nanofiltration, electro dialysis and membrane separation

Week 8: Various types of heat exchangers for food process engineering Various types of driers for food process engineering

Week 9: Importance and applications of extrusion technology in food processing Changes of properties and functional components of extruded foods

Week 10: Food biosensors Types of functional foods: Probiotics and nutraceuticals

Week 11: Packaging considerations: Barrier and mechanical properties of different food packaging materials biocomposite/bionanocomposite materials for food packaging applications

Week 12: Sanitary components and requirements, Regulatory considerations