

17FT002 EMERGING TECHNOLOGIES IN FOOD PROCESSING

Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P	W/RA	SSH/HS	CS	SA	S	BS
45	15	-	15	30	-	5	5	-

Course Objectives:

To study about the concepts and principles of various techniques such as High Intensity Pulse techniques, Light Pulses and emerging aspects in food process engineering. To learn about the equipments used and working principle for the emerging aspects in food process engineering. To know the various applications of the new technologies in food process engineering.

Course Outcomes:

Upon successful completion of this course student should be able to:

- Students are updated of the recent technological advancements in the field of Food Technology.
- Students are appraised of the alternate technologies in Thermal Processing of foods.
- The students are able to apply their knowledge on various technological advancements in the field of Food Technology.

SKILLS:

- ✓ Identify and compare various thermal and non-thermal treatment for a particular process.
- ✓ Understand process and equipment design of an emerging technique.
- ✓ Proficient knowledge of various value added products using emerging techniques.

UNIT – I

Thermal processing: Thermo bacteriology - thermal destruction of microorganisms - thermal death rate kinetics methods of sterilization and equipments involved- latest trends in thermal processing.

UNIT – II

Emerging technologies: Emerging technologies in food processing –necessity and advantages – hurdle technology – concepts and applications behavior of microorganisms during preservation – multi target preservation -minimal processing – optimal range of hurdles - super critical fluid extraction processes in food materials - electrical resistance heating – principles process and equipments.

UNIT – III

Non-thermal processing: High voltage electric pulse treatment in food preservation – radiation preservation of food- ionizing radiation- dosimetry lethal effects on microorganisms - UV light and pulsed light preservation –high hydrostatic pressure process of foods- equipment, processing and effect on microorganisms

UNIT – IV

Drying: Psychrometry - equilibrium moisture contents- theory of drying – drying models - drying rate constant –effective moisture diffusion– activation energy calculation during drying - heat requirements – driers for solid and liquid food- foam mat dryer, vacuum dryer, freeze dryer - microwave heating of food - Process and equipment- application - radio frequency drying, infrared drying, application of ultrasound - inactivation of microorganisms and enzymes

UNIT – V

Value addition processes: Extrusion - cold and hot extrusion – production of pasta -principles-extrusion cooking – single screw and twin screw extruders applications, process and quality of extrudates - value addition by flaking –process and quality assessment - encapsulation – micro and nano level process – process and methods – selection of core and wall materials –quality of encapsulated products - coating – coating materials and equipments – battering and breading, seasoning.

TEXT BOOKS:

1. Fellows, P. 1988. Food Processing Technology. Ellis Horwood International Publishers, Cambridge.
2. Gould,G.W. (Ed).1996. New methods of food preservation. First Edition. Blackie Academic and Professional, London.
3. Kudra,T. and A. S.Mujumdar.2009.Advanced drying technologies. Marcel Dekker, Inc. New York

REFERENCE BOOK:

1. Leniger, H.A. and Beverloo,W.A. 1975. Food Process Engineering. First Edition D. Reidel Publishing Company, Dordrecht, Holland.
2. Marcus Karel Owen R.Fennema and Daryl B.Lund. 1975. Principles of Food Science Part II, Physical Principles of Food Preservation, Marcel Dekker, Inc. New York.
3. Paul Singh, R. and Dennis R. Heldman. 2004. Introduction to Food Engineering. Elsevier India Pvt. Ltd., New Delhi.

ACTIVITY

- Formulation of extruded products using single screw and twin screw extruders and evaluation of its quality.