I-Year, II-Semester	L	T	P	Credits: 4
	3	1	-	

CH556 EMERGING TECHNOLOGIES IN FOOD PROCESSING

UNIT-I

Thermal processing: Thermo bacteriology - thermal destruction of microorganisms - thermal death rate kinetics – heat penetration into food-heat penetration data- lethality of thermal process- methods- improved general method- formula method-process calculations - 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
4. Leniger,H.A. and Beverloo,W.A. 1975. Food Process Engineering. First Edition. D.Reidel Publishing Company, Dordrecht, Holland
5. Marcus Karel Owen R.Fennema and Daryl B.Lund. 1975. Principles of Food science Part II, Physical principles of Food Preservation, Marcel Dekker, Inc. Newyork.
6. Paul Singh, R. and Dennis R. Heldman. 2004. Introduction to Food Engineering. Elsevier India Pvt. Ltd., New Delhi.