SUBJECT NO-AG31005, SUBJECT NAME- PRINCIPLES OF FOOD ENGINEERING

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Overview of the processing operations carried out for converting agricultural produce to food; Classification into momentum, heat and mass transfer operations; Necessity of estimating their transfer rates as function of driving force Momentum Transfer: Pressure drop-flow rate relationship for flow through pipe, rectangular conduit and extruder in laminar flow; Turbulent flow and fanningÃ¢ÂÂs friction factor; Compressible flow: flow through nozzle and porous media; Apparent viscosity, generalized viscosity coefficient and generalized Reynolds number for non-Newtonian fluids; Non-Newtonian liquid flow in pipes and slits Heat Transfer: Steady state heat transfer in conduction, convection and radiation; Overall heat transfer coefficient; Forced, natural convection, condensation and boiling heat transfer; Tubular and plate and fin type heat exchangers and estimation of their effectiveness; NTU-Effectiveness relationship; Unsteady state heat transfer in plate, cylinder and spherical bodies; Numerical methods in heat transfer. Mass Transfer: Molecular diffusion and FickÃ¢ÂÂs Law; Steady state mass transfer in equimolar counter diffusion and diffusion through stagnant medium; Diffusion through varying cross sectional area; Convective mass transfer and mass transfer coefficient; Mass transfer coefficients; Unsteady state mass transfer in plate, cylinder and spherical bodies; Analogy between momentum, heat and mass transfer