TFPE206 TWO-PHASE FLOW AND HEAT TRANSFER

Definitions; Review of one-dimensional conservation equations in single phase flows; Governing equations for homogeneous, separated and drift-flux models; Flow pattern maps for horizontal and vertical systems; Simplified treatment of stratified, bubbly, slug and annular flows.

Thermodynamics of boiling; Pool boiling- onset of nucleation, heat transfer coefficients, critical heat flux, effect of sub-cooling; Flow boiling- onset of nucleation, heat transfer coefficients, critical heat flux, effect of sub-cooling.

Condensation- Film and dropwise condensation

Books:

1. Wallis, G.B., *One dimensional two-phase flows*, McGraw-Hill 1969.
2. Collier, J.B. and Thome, J.R., *Convective boiling and condensation*, Oxford Science Publications, 1994.
3. L S Tong and Y S Tang. *Boiling Heat Transfer and Two-Phase Flow*. Taylor and Francis, 1997.
4. P B Whalley. *Boiling, Condensation and Gas-Liquid Flow.* Oxford University Press, 1987.