

Two phase flow and heat transfer

(3-0-0) *Senati*

Introduction, Flow Regimes, Flow pattern Map ,Homogeneous Flow -pressure drop, Drift Flux-Application Force balance and statistical study, Separated Flow.

Bubbly/Slug flow-predication of bubble velocity, film superficial velocity and pressure drop, Annular and Stratified Flow-calculation procedure for film velocity, flow rate, film thickness, flow correction multiplier.

Measurement of Void Fraction. analog and digital signal analysis, optical probes, probability density function and wavelet analysis, Signal Analysis-data fusion techniques, wire mesh sensors.

Two Fluid-Population Balance Technique-algorithm for solving gas-liquid flow, Volume of Fluid Method-tracking interface, Lattice Boltzmann Model, Smoothed Particle Hydrodynamics.

Molecular Dynamics, Boiling, Condensation, Solid-Liquid Flow, Gas-Solid-Flow.

References:-

1. Ghiaasiaan, S. M., Two-Phase flow, Boiling, and Condensation, Cambridge University Press
2. Brennen, C.E., Fundamentals of Multiphase Flow, Cambridge University Press
3. Collier, J. G. and Thome, J. R., Convective Boiling and Condensation, 3rd ed., Oxford University Press
4. Wallis, G.B., One Dimensional Two Phase Flow, McGraw Hill Higher Education

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