

MME 509: Heat and Mass Transfer

Basic derivation of transport properties based on kinetic theory of gases. Use of dimensionless parameters; Re, Se, Pr. Basic heat transfer equations and mechanisms' steady state and unsteady state heat transfer. Heat transfer coefficients. Application of dimensional analysis to heat flow. Basic mass transfer equations. Mass transfer equations and models. Mass transfer between multiple phases; Mass transfer equipment; Motion of single particles in fluids. Terminal falling velocities. Calculation of pressure drops. Counter current and co-current flow of fluids through packed columns. Theory of similarity, Heat transfer in forced cross and longitudinal flow; Heat transfer and Hydraulic Resistance; Heat transfer by free convection and condensing vapours; boiling liquids; Radiation heat transfer between solids separated by a transparent (diathermal) participating medium; Radiation heat transfer in absorbed medium, calculation of heat exchangers.