AMPL07 TRANSPORT PHENOMENA

UNIT-1 INTRODUCTION TO TRANSPORT PHENOMENON:

1.1 Classification of Transport Processes,

1.2 Conservation Laws,

1.3 Vector and Tensor Calculus,

UNIT-2 PRINCIPLES OF MOMENTUM TRANSPORT

2.1 Concept of Viscosity, Newton's Law of Viscosity,

2.2 Shell Momentum Balance,

2.3 Application of Shell Momentum Balance, Flow of Falling Film,

2.4 Flow Through Circular Pipe,

2.5 Flow Through annulus, Flow Over Moving Plate, Couette Viscometer,

2.6 Equation of Changes: Continuity Equation, Equation Motion,

2.7 Navier-Stokes Equation in Cartesian Co-ordinate's and Cylindrical Co-ordinate,

2.8 Basics of Velocity Distribution

UNIT-3 PRINCIPLES OF STEADY STATE HEAT TRANSPORT

3.1 Steady State Condition and Fourier's Law,

3.2 Shell Energy Balance,

3.3 Applications of Shell Energy Balance:

3.4 Heat Conduction with Electrical Source,

3.5 Heat Conduction with Chemical Heat Source,

3.6 Temperature Distribution in Two Concentric Cylinder's,

3.7 Natural Convention Heat Transfer Governing Equation,

3.8 Flow over Flat Plate

UNIT-4 PRINCIPLES OF MASS TRANSPORT

4.1 Equation of Molecular Mass Transport,

4.2 Molecular Diffusion in Gases,

4.3 Equimolar Counter Diffusion,

4.4 Diffusion of A through Non-Diffusing B,

4.5 Mass and Molar Transport by Convection: Mass and Molar Concentrations,

4.6 Mass Average and Molar Average Velocity,

4.7 Molecular Mass and Molar Fluxes,

4.8 Convective Mass and Molar Fluxes

Reference Books:
1. R. Byron Bird, "Transprt Phenomena", 2nd Edition, John Wiley & Sons (Asia) pvt. Ltd.
2. Christie John Geankoplis, "Transport Processes and Separation Process Principles", 4th Edition, PHI Learning Private Limited., New Delhi
3. Incropera, "Fundamentals of Heat and Mass Transfer", 6th Edition, John Wiley & Sons (Asia) pvt. Ltd.