

## PCE4I101 MASS TRANSFER - II

### Module I:

Liquid-liquid operations: Extraction: Introduction, liquid-liquid equilibrium, analytical and graphical solutions for single and multistage operations, continuous counter-current operation without and with reflux, fractional extraction, equipment for liquid contacting operations, single stage, multistage and continuous contacting equipments.

### Module II:

Leaching: Steady and unsteady state operations, equipments, analytical methods for single and multistage operations.

Adsorption: Theory of adsorption, Industrial adsorbents, adsorption equilibrium – isotherms and isobars, Freundlich isotherm, single and multistage operations, Ion-Exchange.

### Module III:

Drying: Equilibrium, drying rate curve, batch and continuous drying, time of drying and calculations, mechanism of batch drying, equipments for batch and continuous drying operations, design of dryers.

### Reference Books:

1. *Mass Transfer Operations* by R E Treybal, McGraw Hill.
2. *Unit Operations of Chemical Engineering, 7th ed.* by W L McCabe, J C Smith, and P Harriott, McGraw-Hill.
3. *Design of Equilibrium Stage Processes* by B D Smith, McGraw-Hill.
4. *Principles of Mass Transfer and Separation Processes* by B K Dutta, PHI.
5. *Mass Transfer Operations* by ASuryanarayana, New Age International.

### MASS TRANSFER - II LAB

1. To draw the ternary diagram for a system of water – acetone – chlorobenzene.
2. Extraction of oil from a sample of mustard cake.
3. Drying of solids in a tray dryer under forced draft condition.
4. Drying of solids in a rotary dryer.
5. To study the performance of a Swenson-Walker crystallizer and to determine the crystal yield and the efficiency of crystallizer.
6. To determine the mass transfer coefficients for the given system using the experimental setup.