

PCE3I103 MECHANICAL OPERATIONS

Objectives: This course acquaints the students of the mechanical method of sizing, separating & transportation of particles.

ModuleI:

Properties and storage of solids: Characteristics of solid particles and solids in bulk. Size Reduction: Objectives, Methods, and Principles of size reduction, Size reduction equipments: Coarse, Intermediate, and Fine Crushers and Ultra-fine grinders, Open & closed circuit grinding.

ModuleII:

Solid-solid separation: Screening, Electrical separation, Classification, Gravity concentration, and Flotation and their latest equipments.

Solid-liquid separation: Sedimentation and equipments(Thickeners and clarifiers), Filtration: Theory and equipments.

ModuleIII:

Gas-solid separation: Principle and equipments. Transportation of solids: Conveyors and elevators.

Module IV:

Mixing: Theory of solid and liquid mixing and their equipments. Size enlargement, Crystallization, Feeding, Weighing, and Coagulation.

Text Book:

1. *Mechanical Operations, 1st ed. by A K Swain, H Patra, and G K Roy, McGraw-Hill.*

Reference Books:

1. *Unit Operations of Chemical Engineering, 7th ed. by W L McCabe, J C Smith, and P Harriott, McGraw-Hill.*
2. *Mechanical Operations for Chemical Engineers, 3rd ed. by C M Narayanan and B C Bhattacharya, Khanna Publishers.*
3. *Perry's Chemical Engineers' Handbook, 8th ed. by D W Green and R H Perry, McGraw-Hill.*
4. *Introduction to Chemical Engineering by W L Badger and JTBanchero, McGraw-Hill.*
5. *Unit Operations, by G G Brown, et. al., CBS Publishers.*
6. *Handbook of Mineral Dressing: Ores and Industrial Minerals by A F Taggart, John Wiley.*