

UG
Course Code: CH208
Credit: 4
Version: 1
Prerequisite Course: Nil

Department: **Chemical Engineering**
Course Name: **Fluid Particle Mechanics**
L-T-P: **3-1-0**
Approved on:

Size Reduction: Principles of crushing and grinding, Determination of mean particle size and size distribution, Laws of crushing and grinding, Energy required for size reduction, crushing and grinding equipment, closed and open circuit grinding.

Screen Analysis and Size separation: Types of screens, mesh number and size distribution, different types of screening, effectiveness of screen, Particle size analysis, separation efficiency and screening equipment.

Solid-Liquid Separation: Theory of Filtration, Filtration equipment, equations for compressible and incompressible cakes, Constant volume and Constant Pressure Filtration, Press Filter, Rotary drum and vacuum filter. Fiber and fabric filters, sedimentation, classifiers and thickeners, Centrifuges- Principles and applications.

Solid-Gas Separation: Cyclone separators and electrostatic precipitator- Principles and applications.

Fluidization: Fluidization of solids and its applications, Hydraulic and Pneumatic transport of solids.

Mixing: Mixing of liquids and solids, Power requirement in mixing.

Storage and Handling of Materials: Hoppers and bins, Mechanical and pneumatic conveying systems.

Books

1. McCabe, W.L., Smith, J.C., and Harriott, P., "*Unit Operations of Chemical Engineering*", 6th ed., McGraw Hill, 2001.
2. Brown, G. G., et al, "*Unit Operations*," CBS Publishers & Distributors, New Delhi, 1995.
3. Coulson, J. H. and Richardson, J. F., Backhurst, J. R., and Harker, J.H., "*Coulson & Richardson's Chemical Engineering*," Vol. 2, 4th ed., Asian Books Private Ltd., New Delhi, 1998.
4. Perry, R. H. and Green, D.W., "*Perry's Chemical Engineers' Handbook*," 7th ed., McGraw-Hill, 1998.
5. Foust, A.S., et al., "*Principles of Unit Operations*", 2nd ed., John Wiley, Singapore.
6. Chattopadhyay, P. "*Unit Operations of Chemical Engineering*", Vol. I., Khanna Publishers, Delhi, 1998.