Enclosure-V

CO-ORDINATING DEPARTMENT: DEPARTMENT OF INDUSTRIAL CHEMISTRY
SEC III – VALUE ADDED COURSE
ANY SEMESTER BETWEEN II to V

16UICVA02	Mechanical Operations	40 HRS	01 CREDIT

Objectives:

1. To understand properties of solid.
2. To carry out solid-solid separation.
3. To calculate power consumption in mechanical operations.

UNIT-I: Particle Technology (05 HRS)

Introduction to particle technology, solid processing operations, solid/liquid separation, Properties of solid, Characterisation of particle: particle shape, particle size, size distribution, mean particle size.

UNIT-II: Fundamentals of Size Reduction (06 HRS)

Objectives of size reduction, size reduction methods, Factors affecting size reduction process, Energy and power consumption in size reduction, Crushing efficiency, Laws of comminution, Size reduction equipment's and selection criteria for size reduction equipment, .

UNIT-III: Size Reduction Equipments (11 HRS)

Principle, Construction, Working, Advantages and Disadvantages of:

- Jaw Crusher
- Gyratory Crusher
- Roll Crusher
- Ball Mill
- Hammer Mill

UNIT-IV: Screen Analysis (08 HRS)

Introduction to screens, Ideal screen, Actual Screen, Screen analysis, Construction and working of: Trommels, Vibrating Screens, Sieve Shaker.

UNIT-V: Method of Separation of Solid on Specific Principles (10 HRS)

Construction and working of:

- Gravity Settling Tank
- The Rake Classifier
- Riffled Tables
- Jigging and Hydraulic Jigging
- Magnetic Separtors

Text Books:

1. Gavhane K. A. (2009), "*Unit Operations-I*", Nirali Prakashan, ISBN 978-81-90639-66-8.
2. Swain AK- Patra H- Roy GK (2011), "*Mechanical Operations*", Tata McGraw Hill Education Private Limited, ISBN (13):978-0-07-070022-2.

Reference Books:

1. Kiran D Patil (2009), "*Mechanical Operations: Fundamental Principles and Applications*", Nirali Prakashan, ISBN:978-93-80064-09-0.
2. McCabe, Smith and Harriot (2014), "*Unit Opertaions of Chemical Engineering*", McGraw Hill Education Publication, ISBN 0071247106, 9780071247108.