MIPE3003 MATERIAL HANDLING SYSTEMS (3-0-0)

Course Objectives

To provide students with comprehensive knowledge of material handling systems, including design, operation, and maintenance of conveyors (belt, chain), hydraulic/pneumatic conveying, and storage solutions (silos, bunkers). The course emphasizes automation, bulk material properties, and efficient handling techniques for mining and industrial applications.

Module-I: (09 Hours)

Property of bulk material vis-a-vis different bulk handling operation. classification of bulk material transportation systems.

Module-II: (09 Hours)

Design, operation & maintenance aspect of belt conveyor & chain conveyor special conveyor: Their selection & application.

Module-III: (11 Hours)

Hydraulic & Pneumatic conveying.

Module-IV: (09 Hours)

Stacking, blending & reclaiming of bulk materials. Automation & on-line monitoring of bulk material handling system.

Module-V: (07 Hours)

Design of storage system: Silos, bins & Bunkers, Rapid loading system., Merry-go-round systems.

Books:

1. M. A. Ramlu, Mine Hoisting, Oxford and IBH, 1st ed, 1996.
2. D. J. Deshmukh, Elements of Mining Technology, Vol-III, Vidyasewa, 3rd ed, 1989
3. N. T. Karlein, Mine Transport, Orient Longman, 1st ed, 1967
4. N. Mukherjee, Materials Handling in Mines, Technology mining society IIT Kharagpur, Vol- XI, 1st ed., 1979-80

Course Outcomes:

CO1: Classify bulk materials and transportation systems based on their properties and handling requirements. (Understanding)

CO2: Design and evaluate belt/chain conveyors and special conveyors for specific industrial applications. (Application/Analysis)

CO3: Analyze hydraulic and pneumatic conveying systems for efficiency and suitability in material transport. (Evaluation)

CO4: Implement stacking, blending, and reclaiming techniques with automation for optimized material handling. (Application)

CO5: Develop storage solutions (silos, bunkers) and rapid loading systems for bulk material management. (Creation)