

COURSE TITLE : MATERIAL HANDLING
COURSE CODE : 5025
COURSE CATEGORY : E
PERIODS/ WEEK : 4
PERIODS/ SEMESTER : 60
CREDIT : 4

TIME SCHEDULE

MODULE	TOPIC	PERIODS
1	Material Handling Systems	15
2	Components of material Handling systems	15
3	Hoisting Machinery and Equipments	15
4	Conveying Machineries	15
TOTAL		60

COURSE OUTCOME :

sl.no.	sub	student will be able to
1	1	Understand the principles of different material handling systems
	2	Comprehend the various components of material handling system
	3	Appreciate the different hoisting machinery and equipments
	4	Understand the working of different conveying machineries

SPECIFIC OUTCOME

MODULE I

1.1.0 Understand the principles of different material handling systems

- 1.1.1 List the Types of load to be handled- Types of movements-methods of stacking, loading and unloading systems-
- 1.1.2 State the principles of material handling systems-hoisting mechanism- lifting mechanism- traveling, slewing mechanism- cross and traverse mechanism
- 1.1.3 Identify the Factors effecting choice of material handling equipments such as type of loads, hourly capacity, direction and length of travel,
- 1.1.4 Describe the method of stacking at initial intermediate and final points-
- 1.1.5 Determine specific load conditions and economics of material handling systems.

MODULE II

2.1.0 Comprehend the various components of material handling system

- 2.1.1 Illustrate the Flexible hoisting appliances such as welded chains, roller chains, hemp ropes, steel wire ropes,
- 2.1.2 Describe the fastening methods of wire and chains, eye bolts, lifting tackles, lifting and rigging

- 2.1.3 List the Load handling attachments
- 2.1.4 Classify the hooks- forged and eye hook.
- 2.1.5 Explain the Appliances for suspending hooks- crane grab for unit and piece loads- electric lifting magnet, vacuum lifter,
- 2.1.6 Explain the Grabbing attachment for loose materials, crane attachment for handling liquids / molten metal's.
- 2.1.7 Illustrate the Arresting gear and brakes.
- 2.1.8 Describe the construction and working of arresting gear, construction and use of electromagnetic shoe brakes, thruster operated shoe brakes, control brakes.

MODULE III

3.1.0 Appreciate the different hoisting machinery and equipments.

- 3.1.1 Illustrate the Working of different type of hoists such as lever operated hoist, portable hand chain hoist, differential hoist, worm geared and spur geared hoist, electric and pneumatic hoists
- 3.1.2 Describe the Working of different type of cranes such as rotary cranes, trackless cranes, mobile cranes, bridge cranes, cable cranes, floating cranes and cranes traveling on guide rails.
- 3.1.3 Explain the Working of elevating equipments such as stackers, industrial lifts, freight elevators, passenger lifts, mast type elevators, vertical skip hoist elevators.

MODULE IV

4.1.0 Understand the working of different conveying machineries.

- 4.1.1 Illustrate the Working of traction type conveyors such as belt conveyors, chain conveyors, bucket elevators, escalators.
- 4.1.2 Describe the Working of traction less type conveyors such as gravity type conveyors, vibrating and oscillating conveyors, screw conveyors, pneumatic and hydraulic conveyors, hoppers, gates and feeders.
- 4.1.3 List the functions of Surface transport equipment
- 4.1.4 Describe the working of trackless equipment such as hand operated trucks, powered trucks, tractors, AGV (Automatic Guided Vehicle)
- 4.1.5 Describe the working of industrial trailers
- 4.1.6 Explain the functions and working of cross handling equipment such as winches, capstans, turntables, transfer tables, monorail conveyors.

CONTENT DETAILS

MODULE I

Introduction to material handling

Types - Types of movements - methods of stacking - loading - unloading - principles - hoisting mechanism- lifting mechanism- traveling - slewing mechanism- cross - traverse mechanism - Factors effecting choice of material handling equipments - method of stacking at initial intermediate - final points- specific load conditions - economics of material handling systems.

MODULE II

Components of material handling

Flexible hoisting appliances - fastening methods - Load handling attachments – Classification of hooks- forged - eye hook - Appliances for suspending hooks- crane grab for unit and piece loads- electric lifting magnet - vacuum lifter - Grabbing attachment for loose materials - crane attachment for handling liquids - Arresting gear – brakes - construction - working - electromagnetic shoe brakes - construction - use - thruster operated shoe brakes - control brakes.

MODULE III

Hoisting machinery and equipments

Working of different type of hoists - Working of different types of cranes - Working of elevating equipments

MODULE IV

Conveying machinery.

Traction type conveyors - Working - belt conveyors- chain conveyors-bucket elevators- escalators- Working of traction less type conveyors -gravity type conveyors, vibrating and oscillating conveyors, screw conveyors - pneumatic - hydraulic conveyors – hoppers - gates and feeders - Surface transport equipment - functions - working of trackless equipment - hand operated trucks - powered trucks - tractors, AGV (Automatic Guided Vehicle) - industrial trailers - functions - working - cross handling equipment – winches – capstans – turntables - transfer tables - monorail conveyors.

TEXT BOOKS

1. Material Handling Equipment -R.B. Chowdary & G.N.R.Tagore (Khanna Publishers,Delhi)
2. Material Handling (Principles &Practice)-Allegrri T.H(CBS Publisher, Delhi)

REFERENCE

1. Material Handling - Immer J.R (McGraw Hill, Newyork)
2. Materials Management: Text and Cases, 3rd ed. • - Chitale & Gupta
3. Materials Management: Procedures, Text and Cases, 2nd ed. • - Datta
4. Handbook of Materials Management, 2nd ed. • - Gopalakrishnan & Haleem
5. Materials Management : An Integrated Approach • - Gopalakrishnan & Sundaresan
6. Material Handling Equipment – N.Rundenko (Peace Publisher, Moscow)
7. Material Handling Equipment -M.P. Alexandrow(MIR Publishers, Moscow)
8. Material Handling Equipment - Parameswaran M.A (CDC in Mech. Engg., I.I.T. Chennai).
9. Plant layout & Material Handling- Apple J.M (John Wiley Publishers)

