



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3151508

Semester –V

Subject Name: Facility Layout and Material Handling systems

Type of course:

Prerequisite: Nil

Rationale:

Facility Layout and Material Handling course objectives is to learn different types of Location selection methods, it also extends to different layout systems according to type of production. This subject also offer knowledge of other latest tools like CORELAP,ALDEP and CRAFT used for plant layout. Knowledge of Material Handling systems and its Relationship with plant layout helps to minimize cost of material handling. Knowledge of material handling and layout system helps in Industrial building and utilities locations. Analysis of material handling helps to students to compare for cost effectiveness.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Location Selection: Nature of Location Decision, Importance of Plant Location, Dynamic Nature of Plant Location, Factor affecting Plant Location: General Location factor, Specific location factors for manufacturing unit and Specific location factor for service unit. Location theories, Location models: Factor rating method, Weighted Factor rating method, Load distance method, Centre of gravity method, Break even analysis. Comparison of location. Locational Economics.	10
2	Plant Layout: Need for layout, types of layout, factors influencing product, process. Fixed and combination layout: tools and techniques for developing layout: Process chart, flow diagram, string diagram, template and scale models. Layout planning procedure. Visualization of layout, revision and improving existing layout. Quantitative methods of Plant layout: CRAFT, ALDAP and CORELAP, Relationship diagrams.	12
3	Material handling: Introduction to material handling, Manual and mechanical handling, Handling ratio, Effects of handling on productivity, Basic principles of material handling, Analysis of material handling problem, Organizing for material handling, Analysis of cost of material handling, Basic types of material handling equipment and its characteristic, Uses and limitations, Stability of forklift trucks, Selection of material handling equipment, Unit load handling, Palletizing & packaging.	10



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	Methods to minimize cost of material handling, Maintenance of Material Handling Equipment's, Safety in handling, Ergonomics of Material Handling equipment.	
4	Industrial Building and Utilities: Centralized electrical, pneumatic water line systems. Types of buildings, lighting, heating, air conditioning and ventilation utilities: Planning and maintenance, waste handling, statutory requirements. Packing and storage materials: Importance of Packaging, layout for Packaging.	06
5	Analysis of Material Handling: Motion analysis, flow analysis, graphic analysis, safety analysis, equipment cost analysis, palletization analysis, analysis of operation, material handling surveys.	07
	Total Hours	45

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	15	25	20	15	15

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. S Anil Kumar, N Suresh, Production and Operation Management, New Age International Publication..
2. S. C. sharma, Plant layout and material handling, Khanna publishers.
3. Agarwal, Plant layout and material handling, Jain brothers publication.
4. Shubin J A, Plant layout, P H I publications.1965
5. Oberman. Ya, Material handling, Mir publishers.1980
6. S.C. Sharma, Material Management And Material Handling, Khanna Publishers.1995

Course Outcomes: Students will be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Describe location decision and site selection	25
CO-2	DifferentiatePlan layout techniques its importance.	25
CO-3	Illustrate material Handling system.	15
CO-4	Describe Industrial building and utilities.	15
CO-5	Analyze material handling system	20



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Term Work:

The term work shall be based on the topics mentioned above.

List of Experiments: As per content

List of Open Source Software/learning website:

1. Nptel