

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Mechanical (Industrial Engineering)

Semester: II

Subject: Facility Planning & Design

Code: 1724601

Sr. No.	Topic	Hours
1	Introduction: Facilities design function- Scope, Objectives, need for layout study, types of layout problem, Types of flow pattern, Types of plant layout, Nature, Significance and Scope of Facilities Layout Planning, Facility design procedure.	07
2	Plant location: Plant location analysis-factors, costs, Facility location: Single facility location problem, Multiple facility location problem, Gravity facility location problem, Euclidean distance location problem.	06
3	Activity relationship analysis: Activity relationship diagram, worksheet, dimensionless block diagram, Flow analysis, Computer generated REL chart.	04
4	Layout design: Design cycle - SLP procedure manpower, machinery requirements – Computer algorithms - ALDEP, CORELAP, CRAFT.	07
5	Quantitative methods: Group technology-Production Flow analysis (PFA), ROC (Rank Order clustering), Quantitative analysis in cellular manufacturing.	04
6	Manual Assembly Lines: Assembly workstations, Analysis of Single model assembly lines, Line balancing problems, Line balancing algorithm: i) Largest candidate rule ii) Kilbridge and wester method iii) Ranked positional weight method iv) COMSOAL, Mixed model assembly lines, Line of balance.	04
7	Auxiliary Services Requirement Space: Receiving and shipping, Storage, Warehousing, Maintenance and Tool room, Utilities.	04
8	Employee Services-Space requirements: Parking lot, Employee entrances, Locker rooms, Toilets and Restrooms, Lunch room, Recreation, Drinking fountains, Aisles, Medical facilities.	04
9	Materials handling: Cost justification, Goals of material Handling, Principles of material handling, MH problem solving procedure, Unit load concept, material handling system design.	06
10	Material Handling Equipment: Receiving and shipping, Stores, Fabrication, Assembly, Shop floor, Warehousing, Packaging. Computer integrated material handling system.	06
	Total	52

Term Work:

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

Practical / Viva:

The candidate shall be examined on the basis of term-work.

Text Books:

1. Plant layout &Material Handling, G. K. Aggarwal, Jain Publishers, New Delhi.
2. Automation, Production Systems and Computer Integrated Manufacturing, 2nd edition, Mikell P. Groover, Prentice Hall of India, New Delhi, 2003.
3. Plant Layout & Material Handling, 3rd edition, J.M Apple, John Wiley & Sons, 1972, New York.
4. Production and Operations Management, 3rd edition, R. Panneerselvam, PHI Learning Private Ltd., New Delhi, 2012.

Reference Books:

1. Facilities planning, J. A. Tompkins and J. A. White, John Wiley, 1984.
2. Facilities Layout and Location: An analytical approach, Richard Francis L. and John A. White, Prentice Hall Inc., 1984.
3. Plant Layout and Design, Moore, J. M. Macmillan Company, New York, 1970.
4. Manufacturing Facilities Design, 2nd edition, Fred F. Meyers, Matthew P. Stephens, Prentice Hall, New Jersey.
5. Practical Plant layout, Richard Muther, McGraw Hill Book Company, New York
6. Facilities Planning and Materials Handling, Vijay Sheth, Marcle Decker, New York.