

COURSE CODE	FACILITY LAYOUT AND MATERIAL HANDLING	L	T	P	C
1153ME105		3	0	0	3

### 1. Preamble

To understand basic layout for industries, the usage of material handling equipments for industrial layout and gain knowledge on industrial buildings and utilities

### 2. Pre-Requisite

NIL

### 3. Link to Other Courses

Project work

### 4. Course Educational Objectives

Students undergoing this course are expected to

- Understand the concept of facility location and design
- Understand the concept of computerized layout planning.
- Know about the various material handling equipment and utilities of the industries.

### 5. Course Outcomes

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Demonstrate the knowledge about types of facility location problems and various models.	K2
CO2	Design the plant layout	K3
CO3	Demonstrate the knowledge about computerized layout planning and line balancing techniques.	K2
CO4	Know the different types of material handling equipment and packing systems.	K2
CO5	Know the effective selection and contribution of utilities for buildings.	K2

(K2- Understand, K3-Apply)

### 6. Correlation of Cos with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H						L				L	L	M	L
CO2	H						L				L	L	M	L
CO3	H				M		L				L	L	M	L
CO4	H						L				L	L	M	L
CO5	H						L				L	L	M	L

H -High; M-Medium: L-Low

## 7. Course Content

### UNIT I FACILITY LOCATION

L - 9

Introduction , Factors affecting location decisions , Location theory , Qualitative models , Semi-Quantitative models -Composite measure , Brown & Gibbs model , Break-Even analysis model, Single facility location problems – Median model, Gravity location model, Mini-Max model, Multi-facility location problems, Network and warehouse location problems.

### UNIT II FACILITY LAYOUT DESIGN

L - 9

Need for layout study , Factors influencing plant layout ,Objectives of a good facility layout, Classification of layout , Layout procedure – Nadler’s ideal system approach, Immer’s basic steps, Apple’s layout procedure, Reed’s layout procedure –Layout planning – Systematic layout planning – Information gathering, flow analysis and activity analysis, relationship diagram, space requirements and availability, designing the layout.

### UNIT III COMPUTERISED LAYOUT PLANNING

L - 9

Concepts, Designing process layout –CRAFT, ALDEP, CORELAP – Trends in computerized layout, Algorithms and models for Group Technology - ROC and Bond Energy Algorithms. Line balancing - Objectives, Line balancing techniques – Largest Candidate rule Kilbridge and Wester method- RPW method- COMSOAL.

### UNIT IV MATERIAL HANDLING AND PACKAGING

L - 9

Objectives and benefits of material handling, Relationship between layout and material handling, Principles of material handling, Unit load concept, Classification of material handling equipments, Equipment selection, Packing and storage of materials - layout for packaging - packaging machinery - wrapping and packing of materials, cushion materials.

### UNIT IV: UTILITIES

L - 9

Industrial buildings and utilities - Centralized electrical pneumatic water line systems.Types of building, lighting heating, air- conditioning and ventilation utilities. Planning and maintenance, waste handling statutory requirements. Utilities planning

**TOTAL: 45 PERIODS**

## 8. Text Books

1. James, M. Apple., „Plant Layout and Material Handling“, John Wiley & Sons, INC, 1977.
2. Rudenko. N., “Materials handling equipment”, ELnvee Publishers, 1970.
3. Francis, R.L., and White, J.A. Facilities layout and Location, Prentice Hall of India, 2002.

## 9. References

1. James, M. Moore, „Plant Layout and Design“, Macmillan Company, NY, 1963
2. Muther, R., „Practical Plant Layout“, Mc Graw Hill Book Company, NY, 1955
3. Tompkins, White et al., Facilities planning, John Wiley & Sons, inc. 2003.
4. James, Apple, Material Handling System design, Ronald Press, 1980.
5. Krajewski, J. and Ritzman, Operations Management – Strategy and Analysis, Addison – Wesley publishing company inc. 5th Edition, 1999.
- 6.Pannerselvam,R. Production & operations Management, PHI, 2nd Edition, 2005