

22MEHO308		INDUSTRIAL LAYOUT DESIGN AND SAFETY				
<b>PREREQUISITES</b>		<b>CATEGORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
1. Knowledge in basic manufacturing systems.		<b>PE</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
2. Knowledge in operations research						
3. Knowledge in safety regulations.						
<b>COURSE OBJECTIVES:</b>						
1.	To get the basics of process layout & product layout					
2.	To explore the layout planning by computer applications following different algorithms.					
3.	To imbibe knowledge on safety management functions and its techniques.					
4.	To introduce knowledge on accident reporting & investigation procedure.					
5.	To assimilate knowledge on workplace hazards & its control					
<b>UNIT I</b>		<b>INTRODUCTION</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Objectives of a good plant layout, principles of a good layout, Classification of Layout, Advantages and Limitations of different layouts, Layout design procedures, Overview of the plant layout. Process layout & Product layout: Selection, specification, Implementation and follow up, comparison of product and process layout.						
<b>UNIT II</b>		<b>COMPUTERIZED LAYOUT PLANNING</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Heuristics for Plant layout – ALDEP, CORELAP, CRAFT, Group Layout, Fixed position layout- Quadratic assignment model. Branch and bound method, Evaluation of layout.						
<b>UNIT III</b>		<b>SAFETY REGULATIONS</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Need for safety. Safety and productivity. Definitions: Accident, Injury, Unsafe act, Unsafe Condition, Dangerous Occurrence, Reportable accidents. Theories of accident causation. Safety organization- objectives, types, functions, Role of management, supervisors, workmen, unions, government and voluntary agencies in safety. Safety policy. Safety Officer, Safety committee, Overview of factories act 1948 – ISO-45001.						
<b>UNIT IV</b>		<b>SAFETY HAZARDS IN MACHINES</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Machine Guarding, Guarding of hazards, Machine Guarding types and its application – Safety in welding and Gas cutting – Safety in Manual and Mechanical material handling- Safety in use of electricity						
<b>UNIT V</b>		<b>CHEMICAL AND FIRE HAZARDS</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Toxicity- TLV- Types of Chemical Hazards-Occupational diseases caused by dust, fumes, gases, smoke and solvent hazards- control measures Fire triangle- Types of fire - first aid fire fighting equipment – flammability limit- LPG safety - Hazard identification and Risk Analysis, case studies						
<b>TOTAL (45L): 45 PERIODS</b>						
<b>TEXT BOOKS:</b>						
1.	James M Moore-Plant Layout Design, Mac Millan Co.1962 LCCCN61-5204.					
2.	Krishnan N.V. “Safety Management in Industry” Jaico Publishing House, Bombay, 1997					
<b>REFERENCES:</b>						
1.	James Apple, "Plant Layout & Material Handling", The Ronald Press Co., New Delhi, 1998.					
2.	Pannerselvam. R, “Production and Operations Management”, PHI, 2017					
3.	Sunderesh Heragu-Facilities Design, PWS Publishing Company, ISBN-0-534-95183.					
4.	Heinrich H.W. “Industrial Accident Prevention” McGraw-Hill Company, New York, 1980.					
5.	Blake R.B., “Industrial Safety” Prentice Hall, Inc., New Jersey, 1973					
6.	John Ridley, “Safety at Work”, Butterworth & Co., London, 1983.					

<b>COURSE OUTCOMES:</b> Upon completion of this course, the students will be able to:		<b>Bloom Taxonomy Mapped</b>
<b>CO1</b>	Able to get the basics of layout design procedure and selection of appropriate layout for industries.	Create
<b>CO2</b>	The students will be able to plan and design plant and production layouts through basic strategies and with computer application	Create
<b>CO3</b>	Apply principles of safety management, its functions and technique in any organization.	Apply
<b>CO4</b>	Apply machine guarding principles in industrial applications.	Apply
<b>CO5</b>	Realize chemical hazards, toxicity, fire and explosion in the work place and involve to take various control measures to prevent hazards	Understand

<b>COURSE ARTICULATION MATRIX</b>																
<b>COs/POs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
<b>CO1</b>	1	2	1	2	3	2	1	1	2	2	2	2	3	2	2	
<b>CO2</b>	0	1	2	3	0	1	0	1	2	0	2	0	1	2	1	
<b>CO3</b>	0	2	2	1	3	1	1	1	1	0	1	2	2	3	2	
<b>CO4</b>	0	2	1	1	2	0	0	1	1	1	2	0	2	1	1	
<b>CO5</b>	1	2	2	1	2	0	0	1	1	1	2	1	3	2	1	
<b>Avg</b>	<b>0.4</b>	<b>1.8</b>	<b>1.6</b>	<b>1.6</b>	<b>2.0</b>	<b>0.8</b>	<b>0.4</b>	<b>1.0</b>	<b>1.4</b>	<b>0.8</b>	<b>1.8</b>	<b>1.0</b>	<b>2.2</b>	<b>1.0</b>	<b>1.4</b>	
3/2/1 – indicates strength of correlation (3 – high, 2- medium, 1- low)																