

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	OMED625	Principles of Industrial Engineering	3	0	0	3

Prerequisites
Bachelor/Master/PhD students having background in Mechanical Engineering/Production Engineering/Manufacturing Technology
Course Objective
1. Develop systematic understanding of industrial engineering principles and applications. 2. Examine organizational structure, plant location, and layout planning strategies. 3. Master production planning, control, scheduling, and demand forecasting techniques. 4. Apply statistical quality control and total quality management methodologies. 5. Implement work study, method study, work measurement, and ergonomic principles.
Learning Outcomes
1. Students will understand organizational structure and plant location/layout optimization. 2. Students will apply production planning, control, scheduling, and forecasting techniques. 3. Students will implement statistical quality control and total quality management systems. 4. Students will conduct work study, method study, and work measurement analyses. 5. Students will integrate ergonomic principles into industrial work environments. 6. Students will analyze case studies for effective communication of industrial engineering concepts. 7. Students will evaluate production systems for improved efficiency and productivity. 8. Students will design optimal facility layouts and production workflows.

Unit No.	Topics to be covered	No. of Lecture Videos	Video Time (Minutes)	Learning out come
1.	Introduction: Developments Objectives & Functions Introduction: Functions and tools , Tool of IE and Organizational Structure.	5	168	Learn about Organizational structures, objectives and functions; Understanding about tools of Industrial engineering and formulate organizational structure.
2.	Organizational Structure: Roles, Organizational Structure: Type, Organizational Structure: Product Strategies; Organizational Structure: Process & Product Organization; Organizational Structure and culture.	5	154	Learn about organizational roles, types, product strategies, process and product Organization.
3.	Organizational Structure: Principles; Plant Location & Layout: Selection of Site; Plant Location & Layout: Factor, Affecting Selection of Site; Plant Location & Layout: Methods for Selection of Site; Plant Location & Layout: Methods for Selection of Site II.	5	161	Understanding about plant layout location, layout selection of site; Learn about method for selection of site and factor affection selection of site.
4.	Plant Location & Layout: Methods for Selection of Site III, Plant Location & Layout: Methods for Selection of Site IV, Plant Layout: Purpose and Types of Layout, Plant Layout: Types of Layout, Plant Layout: Cellular and Process Layout.	5	150	Learn about method for selection of site, purpose and type of layout used. Understanding about cellular and process layout.

5.	Plant Layout: Process Layout Design, Plant Layout: Process Layout Design II , Plant Layout: Product Layout Design, Organization of Facility, Organization of Facility & Material Handling.	5	174	Learn and understand about process layout design, Product layout design, organizational facility, and material handling.
6.	Material Handling Production Planning and Control: Scope Production Planning and Control: Scope II Production Planning and Control: Capacity Planning Production Planning and Control: Capacity Planning & Scheduling.	5	150	Understanding about material handling with product planning and control scope, capacity planning etc.,
7	Production Planning and Control: MRP, Routing, Scheduling; Production Planning and Control: Scheduling; Production Planning and Control: Priority Sequencing; Production Planning and Control: Priority Sequencing II, Production Planning and Control: Relative Performance of Priority Sequencing Rules.	5	155	Learn and understanding about MRP, Routing, Scheduling, priority sequencing, relative performance of priority sequencing rules;
8	Inventory: Fundamentals; Inventory: Models: Inventory: Models II: Inventory: Wilson Model Inventory: Gradual Replenishment Model	5	162	Learn about an inventory fundamental; Understanding Wilson model, Gradual replenishment model;
9	Project Management & Network Modelling: Introduction; Network Modelling: PERT: Network Analysis: PERT; Network Analysis: PERT II; Network Analysis: Crashing Network and CPM.	5	176	Understanding about project management and networking modelling like PERT, crashing network and CPM etc.
10.	Network Analysis: Critical Path Method; Forecasting: Introduction; Forecasting: Methods; Forecasting: Methods II; Forecasting: Methods III	5	131	Understanding about Critical path method, forecasting methods etc.,
11.	Forecasting: Methods IV; Forecasting: Methods V; Quality Control: Introduction; Quality Control: Fundamentals; Quality Control: SPC	5	158	Learn about forecasting various methods, and understanding the quality control fundamentals with SPC model;
12.	Quality Control: SPC II; Quality Control: Control Charts; Quality Control: Control Charts II; Quality Control: Control Charts for Attributes; Productivity & Work Study.	5	163	Understanding about quality control including control charts, SPC tools, productivity, and work study etc.,
Total		60	1902	

Text Books:

1. Besterfield, D.H., Total Quality Management, Pearson Education, 1999.
2. Russell, R.S. and Taylor, B.W., Operations Management, Pearson Education, 2003.

Reference Books:

3. Jacobs, C.A., Production and Operations Management, Tata McGraw Hill, 1999.
4. Mitra, A., Fundamentals of Quality Control and Improvement, John Wiley & Sons, 2000.