

Branch Name:	Mechanical Engineering
Semester/Year:	Semester VII / Forth Year
Subject Title:	Industrial Engineering
Subject Code:	1ET1010706
Pre-requisite:	Zeal to learn the subject

Course Objectives:

1. This course introduces various aspects like plant location and its selection, plant layout within the plant of different kind of industries.
2. This subject provides basic knowledge and different concept of production planning and control.
3. This course will help to the students about productivity and work-study concepts for productivity improvement in the industry.
4. This subject provides knowledge about quality and its improving techniques.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
02	01	00	03	70	30	-	20	120

Subject Contents				
Sr. No	Topic	Total Hours	Weightage (%)	
1	Location Selection and Plant Layout Nature of location decision, Importance of plant location, Dynamic nature of plant location, Choice of site for selection, Comparison of location, Principles of plant layout and types, Factors affecting layout, Methods, Factors governing flow pattern, Travel chart, Layout of manufacturing shop floor, repair shop	04	12	
2	Production Planning and Control Types of production systems and their characteristics, Functions and objectives of production planning and control, Sales forecasting: Techniques and applications, Steps of production planning and control: Process planning, Leading, Scheduling, Dispatching and Expediting with illustrative examples, Introduction to line of balance, Assembly line balancing and Progress control.	08	30	
3	Productivity and Work Study Definition of productivity, Application and advantages of productivity improvement tools, Reasons for increase and decreases in productivity, Areas of application of work study in industry, Reaction of management and labour to work study, Method Study: Objectives and procedure for methods analysis, Recording techniques, Operations Process Chart, Flow Process Chart, Man-Machine Chart, Multiple Activity Chart, Travel Chart, and Two Handed process chart, String Diagram, Therbligs, Micro motion and macro-motion study: Principles of motion	08	30	

	economy, Normal work areas and work place design, Work Measurement: Objectives, Work measurement techniques: time study, work sampling, pre-determined motion time standards (PMTS), Determination of time standards, Observed time, Basic time, Normal time, Rating factors, Allowances and standard time. Introduction to ergonomics.		
4	Inspection and Statistical Quality Control Inspection: functions, types, objectives and benefits, Quality control principles, Concepts of quality circles, Total quality management, Quality assurance, Quality audit, Basic Concept ISO 9000, ISO 14000 and QS 9000, Six sigma: Concept, Principle, Methodology, Scope, Advantage and limitations. SQC Concept, Variable and attributes, Normal distribution curves and its property charts for variable and attributes, their applications and interpretation (analysis) process capability, Acceptance sampling, Sampling plans, OC curves and AOQ curves.	08	28

Course Outcomes:

The student will be able to

1. Select proper site and make an appropriate plant layout for particular industry or firm.
2. Implement basic tools of production planning and control to the production channel.
3. Apply different work study techniques and understands its importance for better productivity.
4. Apply various statistical quality control techniques for inspection and improving quality.

List of Reference Book:

1. Telsang, Martand. "Industrial engineering and production management." S. Chand, 2006.
2. Mahajan, Monohar. "Statistical quality control." Edition-1998, Dhanpat Rai & Sons, India 2001.
3. Banga, T.R., and S.C. Sharma. "Industrial engineering & production management." Khanna Pub., 2009.
4. Riggs, James L. and James L. Riggs. "Production systems: planning, analysis, and control." New York: Wiley, 1970.

List of Tutorial:

1. Case study on location decision and site selection for any industry.
2. Case study on plant layout problem.
3. Exercise on sales forecasting problems by applying different techniques.
4. Exercise on planning, scheduling and sequencing problems for shop floor.
5. Exercise on assembly line balancing and line of balance problems.
6. Exercise on OPC, FPC and Travel chart.
7. Exercise on method study, motion study and work measurement problems.
8. Exercise on statistical quality control techniques.

E-Resources:

1. <https://nptel.ac.in/courses/112107142/>