

Industrial Engineering - Video course

Work Study

Historical background; Work study definition; Role of work study in improving productivity; Ergonomics and work study.
Work study procedure: selection of jobs; Information collection and recording; Recording techniques -charts and diagrams; critical analysis; developing better method; installation and follow up of standard method.

Motion Study

Memomotion and micromotion study; therbligs; cyclegraph and chronocyclegraph; simochart; Principles of motion economy; Design of work place layout.

Work measurement

Definition; Procedure; Performance rating; Concept of normal time; allowances. Work sampling technique of work measurement.
Introduction to pre -determined motion time system.

Quality & Reliability

Introduction and definitions of quality Evolution of Quality: Inspection, Quality Control, Customer-Oriented: Internal & External Customer Concept, Life cycle approach to quality costs- Prevention; Appraisal and Failure costs. Seven QC tools (Histogram, Check sheets, Ishikawa diagrams, Pareto, Scatter diagrams, Control charts). Process capability concepts.

Facilities Design

Site Selection: Factors influencing the selection, rural and urban locations of "" sites, optimum decision on choice of site and analysis.
Plant Layout: Types of production, types of layouts, advantages and disadvantages of layout, factor affecting layout, systematic layout planning, Material handling: importance, principles of material handling

Operations Research

Introduction, general methodology of OR, application of OR,
Formulation of linear programming, deterministic models, graphical solution, simplex algorithm,

Reliability

Introduction, Definitions, reliability evaluation, maintainability, and availability concepts.

Capacity Planning

Introduction, measures of capacity, capacity strategies, A systematic approach for capacity decisions, Long range capacity planning and control, Medium range capacity planning and control, Short range capacity planning and control.

Inventory Management

Introduction, Inventory related costs, EOO model, EPO model, Inventory models allowing shortages, Inventory models allowing price discounts, Inventory model under risk conditions, Inventory control systems: continuous review, periodic review, optional replenishment etc., Inventory classification systems: ABC, FMS, VED etc, MRP.

CPM/PERT



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Mechanical Engineering

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Introduction, Project scheduling with CPM, Project scheduling with PERT.
Loading and Scheduling
General scheduling problem, Significance of loading and scheduling,
Factors affecting scheduling, Scheduling system, Flow shop
scheduling, Job shop scheduling, Sequencing, Line balancing.

Forecasting

Introduction, Demand patterns, Factors affecting demand, Subjective forecasting methods, Casual forecasting methods, Time series forecasting methods, Routine short term forecasting methods, Selection of forecasting model.

PPC

Introduction, System approach, Type of manufacturing systems, Factors affecting manufacturing systems.

Product design and development

Introduction, marketing aspects, functional aspects, operational aspects, durability and dependability, aesthetic aspects, economic analysis, profit and competitiveness, the three S's, break even analysis, economics of a new design, production aspects.

Lecture Details:

1. Work Study: Historical background. Definition. Role in improving productivity. Ergonomics and work-study.
2. Work study Procedure: Selection of job for method study and defining problem. Information collection.
3. Information recording techniques: charts and diagrams. 4. Critical analysis of information recorded.
5. Developing better method and installation as standard method.
Follow up,
6. Memomotion and micromotion study; therbligs, simochart.
7. Cyclegraph and chronocyclegraph; Principles of motion economy.
Design of workplace layout.
8. Work measurement definition, applications and procedure.
9. Performance rating and concept of normal time; allowances; determination of standard time.
10. Work sampling technique of work measurement.
11. Introduction of PMT systems.
12. Introduction and definitions of quality,
13. Evolution of Quality, Inspection, Quality Control, its benefits
14. Customer-Oriented: Internal & External Customer Concept, Life cycle approach to quality costs- Prevention; Appraisal and Failure costs.
15. Seven QC tools (Histogram, Check sheets, Ishikawa diagrams, Pareto, Scatter diagrams, Control charts).
16. Control charts; x bar chart, c chart 17. P c.hart, u chart
18. Process capability concepts.
19. Site Selection: Factors influencing the selection,
20. Rural and urban lqations of sites, optimum decision on choice of site and analysis.
21. Plant Layout: Types of production, types of layouts, advantages and disadvantages of layout,
22. Factor affecting layout, systematic layout planning,
23. Material handling: importance, & principles of material handling,
24. Introduction, general methodology of OR, application of OR,
25. Formulation of linear programming, graphical solution,
26. Simplex algorithm,
27. Introduction, Definitions, reliability evaluation,
28. Maintainability, and availability concepts.
29. Introduction to capacity, measures of capacity and strategies for capacity.
30. A systematic approach for capacity management
31. Introduction to inventory management and simple inventory models
32. Inventory models with varying market conditions (such as, discounts, risk factors etc.)
33. Inventory classification and inventory control systems
34. MRP
35. Project scheduling with CPM
36. Project. scheduling with PERT

37. Introduction, strategies and methods for aggregate planning
38. General scheduling problem and factors affecting scheduling
39. Flow shop and job shop scheduling
40. Sequencing and line balancing
41. Introduction to forecasting, demand patterns, factors affecting demand
42. Time series forecasting methods
43. System approach to PPC
44. Types of manufacturing systems, factors affecting manufacturing systems
45. Introduction to product design and development process

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