

5.5 PRODUCTION MANAGEMENT

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4 - 2

RATIONALE

Diploma holder is responsible for controlling production and quality of the product on the shop floor as well as for production planning and control. He is also required to supervise erection, installation and maintenance of equipment including material handling and undertake work-study for better utilization of resources. For this purpose, knowledge and skills about these topics need to be imparted to them. This subject aims at development of competencies to prepare material, equipment schedule and production control schedules and maintain required quality levels. In addition, it will also help in developing skills in erection, installation and testing of equipment.

Learning Outcomes

After undergoing this course, the students will be able to:

- Solve planning, scheduling and sequencing problems for shop floor
- Interpret different kinds of production systems
- Prepare break-even analysis and Gantt chart.
- Explain the importance of inspection.
- Prepare various control charts.
- Apply different techniques to improve quality of products and processes.
- Carryout estimating and costing of production cost
- Explain the objective, importance and types of maintenance.
- Explain the salient features of labour legislation Acts.

DETAILED CONTENTS.

1. Production Planning and Control (PPC) (12 Periods)
 - 1.1 Introduction.
 - 1.2. Objectives and factors affecting PPC
 - 1.3. Functions(Elements) of PPC - Planning, Routing, Loading, scheduling, dispatching, progressing and inspection
 - 1.4. Types of production system - Flow or continuous production, Intermittent Production
 - 1.5. Production Control - Objectives and fields of production control, Production control system
 - 1.6 Break even analysis and Gantt chart.

2. Inspection and Quality Control (14 Periods)
- 2.1. Inspection – Introduction, Need and Importance
 - 2.1.1. Types of Inspection
 - 2.1.2. Role of operator and inspector in inspection
 - 2.2 Quality Control
 - 2.2.1 Introduction, Need and Importance
 - 2.2.2 Factors affecting product quality
 - 2.3 Quality Assurance
 - 2.4 Statistical Quality Control (SQC)
 - 2.4.1 Acceptance Sampling, Sampling Plan- Single and double sampling plan
 - 2.4.2 Operating Characteristics Curve
 - 2.4.3 Control Charts – Introduction, advantages, Types of control charts(X, R, p and c charts)
 - 2.4.4 Concept of ISO 9000, ISO 14000 and TQM.
 - 2.4.5 QC tools
 - 2.4.6 6σ Approach
3. Cost Estimation (14 Periods)
- 3.1 Definition and functions of cost estimation
 - 3.2 Estimation procedure
 - 3.3 Elements of cost, ladder of costs (simple numericals)
 - 3.4 Overhead expenses and its distribution
 - 3.5 Depreciation- Concept and Definition, Methods of calculating depreciation- Straight line method, Diminishing Balance Method, Sinking fund method (Numerical problems).
 - 3.6 Cost control- definition and objectives, Capital cost control (planning and scheduling), operating cost control.
 - 3.7 Cost estimation for machining processes like turning, drilling, and milling. Cost estimation of forming processes like forging, pattern making, and casting.
4. Repair and Maintenance (08 Periods)
- 4.1 Objectives and importance of Maintenance
 - 4.2 Different types of maintenance- Corrective or Breakdown maintenance, Scheduled Maintenance, Preventive Maintenance, Predictive Maintenance
 - 4.3 Nature of maintenance problems
 - 4.4 Range of maintenance problems
5. Labour Legislation and Pollution Control Acts (08 Periods)

- 5.1 Factory Act 1948.
- 5.2 Workmen's compensation Act 1923.
- 5.3 Apprentices Act 1961.
- 5.4 Water Pollution Control Act 1974 and 1981.
- 5.5 Air Pollution Control Act 1981.
- 5.6 Environmental protection Act 1986.
- 5.7 PF Act, Employee's State Insurance (ESI) Act
- 5.8 Pollution control provision in Motor Vehicle Act.

LIST OF PRACTICALS

- 1. Prepare a flow diagram
- 2. Prepare a Gantt chart
- 3. Draw X, R, p and c charts
- 4. Estimate the cost of turning
- 5. Estimate the cost of drilling
- 6. Prepare maintenance schedule

INSTRUCTIONAL STRATEGY

- 1. Use computer based learning aids for effective teaching-learning.
- 2. Students should be taken to various industrial units for clear conception of various topics.
- 3. Efforts should be made to relate the process of teaching with direct experiences in the industry.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Model/prototype making

RECOMMENDED BOOKS

- 1. Production Management by C.L. Mahajan; Satya Parkashan Company Limited, New Delhi.
- 2. Mechanical Costing, Estimation and Project Planning by CK Singh; Standard Publishers, New Delhi.
- 3. Industrial Engineering and Management by T.R. Banga and SC Sharma; Khanna Publishers, Delhi.

4. Industrial Engineering and Management by O.P. Khanna; Dhanpat Rai and Sons, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	22
2	14	25
3	14	25
4	08	14
5	08	14
Total	56	100