B.Tech IV Year I Semester

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS) PULIVENDULA

19AME74f- PRODUCTION AND OPERATIONS MANAGEMENT

(Professional Elective-III)

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Course Objectives: The objectives of the course are to make the students learn about

- Introduction to the technical design and manufacturing operations and supply management to the sustainability of an enterprise.
- Need for forecasting and types of forecasting.
- Import the basic principles of project management and other business functions such as value engineering, purchasing, marketing, finance etc.
- Analyze the new demands of the globally competitive business environment that supply chain managers face today.
- Knowledge on various scheduling algorithms applicable to single machine, parallel machines, flow shop and job shop models.

UNIT – 1: Introduction: **10 Hrs**

Operations Management – Definition, Objectives, Types of Production System, Difference between OM & PM, Historical Development of Operations Management, Current Issues in Operation Management, Product Design – Requirements of Good Product Design, Product Development – Approaches, Concepts in Product Development, Standardization, Simplification, Speed to Market, Introduction to Concurrent Engineering.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand the concepts of operations management, production systems   **L1**
- Analyze steps in design a new product.   **L4**

UNIT – II: Forecasting: **10Hrs**

Introduction, Statistical Forecasting Techniques, Moving Average, Exponential Smoothing Technique, Errors in Forecasting and Evaluation of Forecasting Techniques.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand the concept of forecasting.   **L1**
- Understand and analyze the various methods of forecasting   **L1**

UNIT – III: Value Engineering and Plant Layout: **10Hrs**

Value Engineering – Objectives, Types of Values, Function and Cost, Product Life Cycle, Steps in Value Engineering, Methodology in Value Engineering, FAST Diagram and Matrix Method. Facility Location and Layout – Factor Considerations in Plant Location, Comparative Study of Rural and Urban Sites, Methods of Selection of Plant Layout, Objectives of Good layout, Principles, Types of Layout, Line Balancing.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand the concepts of value engineering   **L1**
- Identify the factors for locating a Plant Layout   **L3**
- Understand types of plant layout and line balancing   **L1**

UNIT – IV: Aggregate Planning and MRP: **8 Hrs**

Aggregate Planning – Definition, Different Strategies, Various Models of Aggregate Planning-Transportation and Graphical Models, Master scheduling, Material Requirement Planning(MRP)-Terminology, Types of Demands, Inputs to MRP, Techniques of MRP, Lot Sizing Methods, Benefits and Drawbacks of MRP, Manufacturing Resources Planning (MRP II), Just in Time (JIT) Philosophy, Kanban System, Calculation of Number of Kanbans, Pull Systems vs. Push Systems, Requirements for Implementation of JIT, JIT Production Process, Benefits of JIT.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand the concepts of aggregate planning, material requirement planning and JIT   **L1**
- Implement the concepts of JIT   **L5**

UNIT – V: Scheduling: **8Hrs**

Policies, Types of Scheduling, Scheduling Strategies, Scheduling and Loading Guidelines, Forward and Backward Scheduling, Grant Charts, Priority Decision Rules, Flow Shop Scheduling, Job Shop Scheduling, Line of Balance.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand types and policies of scheduling.   **L1**
- Analyze and implement single machine, parallel machine, flow shop, and job shop scheduling algorithms   **L6**

Text Books:

1. Buffa E.S. and Sarin R.K., Modern Production / Operations Management, 8th Edition, Wiley India Pvt. Ltd., New Delhi, 2009.
2. Joseph G. Monks, Operations Management-Theory and Problems, 3rd Edition, McGraw Hill Education, 1987.

Reference Books:

1. James L. Riggs, Jim Rigs, Production Systems: Planning, Analysis and Control, 4th Edition, Wave Land Press, 1992.
2. Chary S.N., Production and Operations Management, 5th Edition, McGraw Hill Education, 2017.
3. Richard B.Chase, Ravi Shankar, Robert Jacobs F., Operations and Supply Chain Management, 15th Edition, McGraw Hill Education, 2018.
4. Pannerselvam R., Production and Operations Management, 3rd Edition, PHI Learning Pvt. Ltd., New Delhi, 2012.
5. Steven Nahmias, Tava Lennon Olsen, Production and Operation Analysis: Strategy – Quality – Analytics – Applications, 7th Edition, Waveland Press Inc., 2015.

Course Outcomes:

At the end of this Course the student will be able to

- Demonstrate the operations and supply management to the sustainability of an enterprise   **L2**
- Identify the need for forecasting and understand different forecasting methods   **L3**
- Identify various production and plant layouts   **L3**
- Examine the quality control of the production   **L4**

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