OPERATIONS MANAGEMENT

Course Code: INM 532
Contact Session: 45

Credits: 03
Marks: 100

Introduction:

The course is designed to familiarize the students with decision making in planning, scheduling, control and productivity improvement in production and operations function in both manufactories and service organizations.

Learning Objective:

The course objectives are-

- The objective of the course is to introduce the concepts, models, tools and techniques, to manage operations in manufacturing and service organizations

course Outcome:

- Understand the concepts, principles, problems, and practices of Operations Management.
- Understand the importance of an effective operations strategy in an organization.
- Understand the various production and operations design decisions and how they relate to the overall strategies of organizations.

Unit 1: Operations Management – An Overview:

Operations Management Decisions: Historical Evolution of Operations Management: Scientific Management, Moving Assembly Line, Hawthorne Studies, Operations Research, Computers and Advanced Operations Technology.

Unit 2: Operations Strategy:

Operations Strategy as a Competitive Weapon: Shorter Product Life Cycle, Production Flexibility, Low-cost Process, Convenience and Location, Product Variety and Facility Size, Quality - Elements of Operations Strategy – Designing the Production System, Finished Goods Inventory Policy, Product/Service Design and Development, Developing an Operations

Registrar,
ICFAI University Tripura
Kamalghat, Tripura (West).

Strategy. Financial and Economic Analysis in Operations: Pay Back Method, Net Present Value (NPV) Method.

Unit 3: Allocating Resources to Strategic Alternatives:

Allocation Decisions in Operations Strategy: Components of Constrained Optimization Models, Merits and Demerits of Constrained Optimization Models. The transportation problem in Linear Programming: Developing an Initial Feasible Solution (Both Balanced and Unbalanced problems).

Unit 4: Design of Production Processes:

Introduction, Process Planning and Design, Major Factors Affecting Process Design Decisions: Nature of Demand, Degree of Vertical Integration, Flexibility, Degree of Automation, Quality Level and Degree of Customer Contact - Types of Process Designs: Product Focused, Process Focused, Group Technology - Process Planning Aids: Assembly Charts, Process Charts, Selecting the Type of Process Design - Variety and Volume.

Unit 5: Facility Location and Layout:

Introduction, Importance of Location - Factors Affecting The Location Decisions: Market Proximity, Integration with other parts of the Organization, Availability of Labor and Skills, Site Cost, Availability of Amenities, Availability of Transportation Facilities, Availability of Inputs,, Availability of Services, Suitability of Land and Climate, Regional Regulations, Room for Expansion, Safety Requirements, Political, Cultural and Economic Situations, Regional Taxes, Special Grants and Import/Export Barriers – General Steps in Location Selection & Location Decision Process: Define the Location Objectives and Associated Constraints, Identify the Relevant Decision Criteria, Relate the Objectives to the Criteria Using Appropriate Models, Do Field Research to get Relevant Data and Use the Models to Evaluate the Alternative Locations, Select the Location that Best Satisfies the Criteria - Location Evaluation Methods: Cost-Profit-Volume or Break Even Analysis, Point Rating Method, The Transportation Method of Linear Programming, Center of Gravity Method of Plant Location, Analytic Delphi Method – Locating Service Facilities-Facility Layout Criteria for a Good Layout - Basic Layout Formats: Process Layout, Product Layout, Group Technology Layout, Fixed Position Layout, Hybrid Layout - Developing a

Process Layout: Graphic and Schematic Analysis, Computer Models - CRAFT, Load Distance Model - Developing a Product Layout: Line Balancing -Model Line Balancing - Developing a Cellular Manufacturing Layout – Japanese Approaches and Trends in Manufacturing Layouts - Service Facility Layouts.

Unit 6: Work Measurement:

Introduction- Uses of Setting Work Standards – Work Measurement Techniques: Time Study, Standard Data, Predetermined Motion Time Study, Work Sampling, Historical Analysis, Employee Self Timing.

Unit 7: Aggregate Planning and Capacity Planning:

Introduction, Overview of Planning Activities: Business Planning, Operations Planning - The Aggregate Planning Process: Concept of Aggregation, Aggregate Planning Goals, Forecasts of Aggregate Demand, Inter- Relationships among Decisions, Strategies for Developing Aggregate Plans, Pure Planning Strategies, Aggregate Planning Techniques: Graphical Model for Aggregate Output Planning, Optimal Models for Aggregate Planning, Computer Search Models, - Master Production Schedule: Master Production Scheduling, Master Schedule Formation, Implementing Aggregate Plans and Master Schedules, Unplanned Events, Behavioral Considerations, Capacity Planning: Measuring Capacity, Determining Capacity Requirements, Economies of Scale, Planning Service Capacity.

Unit 8: Fundamentals of Inventory Control: -

Introduction, Purpose of Inventories: Smooth Production, Better Service to Customers, Protection Against Business Uncertainties, Take Advantage of Quantity Discounts - Inventory Costs - Purchase Costs, Carrying Costs, Ordering Costs, Stock-out Costs - Inventory Systems - Fixed Order Quantity System, Fixed Order Period System, Economic Order Quantity Model - Reorder Point, Optimal Order Quantity. Inventory Classification Models- ABC Classification, VED Classification, FSND Classification.

Unit 9: Materials Management:

Introduction, Necessity of Materials Management, Functions of Materials Management: Production Control, Inventory Control, Materials Handling, Materials Management Technology – Robots, Automated Storage and Retrieval Systems. Materials Management Techniques: JIT Purchasing, Kanban Systems- ABC Classification Systems.

Unit 10: Materials Requirement Planning:

Introduction, Fundamentals of Materials Requirement Planning: Objectives of MRP: Components of an MRP System: MRP System Inputs, MRP System Information Processing, MRP System Outputs, Advantages and Disadvantages of MRP System – Advantages, Disadvantages. Problems in Implementing MRP Systems: Inadequate Employee Training and Involvement, Use of Inaccurate and obsolete data, Inappropriate Product Environment - Manufacturing Resource Planning (MRP II).

Unit 11: Operations Scheduling:

Introduction, Purpose of Scheduling, Scheduling Methods: Forward Scheduling, Backward Scheduling, Scheduling Activities: Routing, Loading, Dispatching, Scheduling by type of operations: Job Operations, Repetitive Operations, Labor-intensive Operations, Service Operations,. Scheduling Personnel in Service Operations: Scheduling Consecutive Days Off, Scheduling Daily work Times, Scheduling Hourly work Times. Scheduling Techniques: Gantt Charts, Johnson's Job Sequencing Rules, Queuing Analysis, Critical Ratio Method.

Unit 12: Enterprise Resource Planning:

Introduction, Evolution of ERP, Business Process Reengineering, BPR and IT- Business Modeling for ERP: Integrated Data Model – ERP Implementation: ERP Implementation Methodology, Implementation of ERP Packages, Guidelines for ERP Implementation,. ERP and Competitive Advantage – Price, Delivery, Reliability and Speed, Quality Product Range.

Unit 13: Supply Chain Management:,

Introduction, Business Drivers in Supply Chain performance: Inventory, Transportation, Facilities, Information - Principles of Supply Chain Management: Segment Customers based on Service Needs, Customize the Logistics Network, Plan based on Market Demand, Enhance ability to meet Customer Requirements, Improve relationships with the Suppliers, have a Supply

Chain wide Technology Strategy, Devise a complete Supply Chain Performance Measure - Forces Shaping Supply Chain Management: Consumer demand, Globalization, Competition, Information and Communication, Government Regulation, Environment - Supply Chain Management Framework: The Seven SCM Components, The Six SCM Enablers: Customer focus in Supply Chain Management: Demand Chains: A focus on end users, Broad trends & misconceptions, Creating the demand chains of the future – Electronic Supply Chain Management: ESCM Advantages, ESCM Implementation, Issues relating to ESCM.

Unit 14: Just-In-Time (JIT) Manufacturing System:

Introduction, The Concept of the JIT System: People Involvement, Total Quality Control, Advantages of JIT Systems - Characteristics of JIT Systems. Uniform Workstation Loads, Small Lot Sizes, Closer Supplier Ties. Maintaining High Quality, Quick and Economic Setups, Flexible Facilities and Multi Skilled Workforce, Preventive Maintenance, Continuous Improvement.

Unit 15: Productivity and Quality Management:

Introduction, Productivity: Productivity Defined, Components of Productivity, Factors Affecting Productivity, Measuring Productivity, Productivity and Quality. The Strategic Role of Quality: Role of Inspection in Quality Control, The Cost of Quality: Cost of prevention, Cost of detection/appraisal, Cost of failure - Statistical Concepts in Quality Control: Control Charts: Control charts for variables, Control charts for attributes; Acceptance Plans, Computers in Quality Control, Concept of TQM. TQM Principles.

Unit 16: Facilities and Maintenance Management:

Introduction, Facilities Management: Nature of Facilities Management, Functions of Facilities Managers, Outsourcing the Facilities Management Function, Facilities Management in India, Facilities Management and Maintenance. Necessity of Maintenance Management: Impact of Poor Maintenance, Areas of Maintenance, Types of Maintenance – Preventive Maintenance - Predictive Maintenance – Remedial Maintenance - Economies of Maintenance. Evaluation of Preventive Maintenance Policies, Maintenance Planning: Bathtub Curve, Contract Maintenance. Modern Approaches to Preventive Maintenance, Recent trends in Maintenance.

Registrar
ICFAI University Tripura
Kamalghat, Tripura (West).

Unit 17: Project Management:

Necessity of Project Management – Networking Modeling: Networking Conventions, Advantages of Network Modeling, Networking Technology. Project Planning Methods: Critical Path Method (CPM), Program Evaluation & Retention Technique (PERT), Project Crashing.

Unit 18: Trends in Operations – Technology:

Introduction, Automation: Advantages, Disadvantages of Automation, Overview of Manufacturing Activities: Automation in Design and Engineering Support, Computer Aided Design - Automation in controlling Processing Equipment:, Flexible Manufacturing System, Computer Integrated Manufacturing (CIM) - Artificial Intelligence: Expert Systems, Robotics, Electronic Data Interchange.

Unit 19: Case Study: Technical Analysis

Reference :

Essential readings

- Operations Management- Gaither&Frazer
- Production Operations Management: Manufacturing & Services - Richard B.Chase, (Tata McGrawHill)NicholasJ.Acquilano&F Robert Jacobs
- Operations Management: Customer Focused Principles- Richard Schonberger& Edward M.Knod
- Operations Management- Roberta S.Russell &Bernard W.Taylor 4thEdition
- Production & Operations Management- K.Aswathappa &K.Sridhara Bhatt
- Modern Production &Operations Management- S.Buffa and Rakesh K.Sarin
- The Essence of Total Quality Management- John Bank
- Production and Operations Management- EverretteE.Adamand Ronald JEbert /Prentice Hall of India, NewDelhi,5th Edition
- Operations Management- Lee J Krajweski and Larry P.Ritzman/ Person Education Delhi 6th edition

- Operations Management- Russel & Taylor, 4th Edition

Suggested Readings

- Operations Management, Chase et.al – Tata McGraw Hill
- Operations Management, MeenakhiKumari, Cengage
- Production and Operations Management, KaniskaBedi, OXFORD
- Production and Operations Management, K. Aswathappa, K. Shridhar Bhat, HPH
- Production &Operations Management, SP Singh, Vikas Publication
- Operations Management, Heizer and Render, Pearson

.....

Registrar,
ICFAI University Tripura
Kamalghat, Tripura (West).