GE: MG 404: PRODUCTION AND OPERATIONS MANAGEMENT

Course Objectives:

To familiarize the students with the role of operations and its interaction with other activities of a firm and their integration in a highly competitive global environment. To enable the students to apply the understanding of production processes in quantitative analysis of problems arising in the management of operations.

Learning Outcomes:

- Understand the role of operations management in achieving organizational competitiveness.
- Appreciate the concepts of lean production and maintenance management in operations.
- Comprehend key decision areas of operations and analyze data for effective decision making in operations management.

Course Contents:

Unit I **(3 Weeks)**

Introduction to Operations Management: Definition, need, key decisions of OM, goods vs. services. Operations as a key functional area in an organization; Operation Strategies: Definition, relevance, strategy formulation process; Maintenance Management: Need of maintenance management, equipment life cycle (Bathtub curve), measures for maintenance performance (MTBF, MTTR and availability).Lean production: Definition of lean production, lean Demand Pull logic, waste in operations, 2 card kanban Production Control system; Process Selection: Definition, Characteristics that influence the choice of alternative processes (volume and variety), type of processes- job shop, batch, mass and continuous.

References:

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education

[Chapter 1: 1.1 to 1.6, page 2-15]

[Chapter 2: 2.1 to 2.2, page 22-28]

Mahadevan, B, Operations Management: Theory & Practice, 2nd ed., Pearson Education

[Chapter: 19, 19.1-19.3, page 609 to 615]

[Chapter 13: 13.1 to 13.5, 13.7, page 358-366, 370-374]

[Chapter 9: 9.1 to 9.2, page to 218-229]

Unit II **(3 Weeks)**

Layout Decision: Layout planning, Benefits of good layout, importance, different types of layouts (Process, Product, Group technology and Fixed position layout). Assembly line balancing by using LOT rule;Facility Location: Objective, factors that influence location decision, location evaluation methods- factor rating method.Capacity planning: Definition, input and output measures of capacity, types of capacity planning over time horizon. Decision trees analysis for capacity planning.

References:

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education

[Chapter: 9, 9.4-9.5, page 230 to 236]

Jacobs, F.R., Chase, R.B. and Ravi Shankar, Operations and Supply Chain Management, 14th ed., McGraw Hills.

[Chapter: 8, page 215-221]

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education

[Chapter: 6, 6.1-6.3, page 126-136]

[Chapter: 8, 8.6-8.8, 8.11, page 192 to 198, 206 to 208]

Unit III **(3 Weeks)**

Forecasting: Definition, types, qualitative (grass roots, market research and Delphi method) and quantitative approach (simple moving average method, weighted moving average and single exponential smoothing method), forecast error, MAD, issues related with forecasting in services; Aggregate Planning: Definition, nature, strategies of aggregate planning, methods of aggregate planning- level plan, chase plan and mixed plan (keeping in mind demand, workforce and average inventory); Scheduling: Operation scheduling, goals of short term scheduling, job sequencing (FCFS, SPT, EDD, LPT, CR) & Johnson's rule on two machines, Gantt charts.

References:

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education

[Chapter: 14, 14.1-14.3, 14.7, 14.9, page 392 to 396, 400 to 403, 411 to 415]

Russell& Taylor, Operations & Supply Chain Management (International Student Version), 8th ed., Wiley

[Chapter: 12, page 369 to 384, 391 to 397]

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education
[Chapter: 15, 15.1-15.6, page 426 to 447]
[Chapter: 18, 18.1-18.5, page 542 to 555]

Unit IV **(3 Weeks)**

Statistical Quality control: Variations in process (common & assignable causes); Control charts: Variable measures (mean and range chart), Attribute measures (proportion of defects and no. of defects) using control tables; Elementary Queuing Theory: need of queuing theory in service and manufacturing operations, Poisson- Exponential Single Server Model with Infinite Population.(M/M/1 queuing model).

References:

Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education
[Chapter: 19, 19.4-19.6, page 577 to 599]
Russell& Taylor,Operations & Supply Chain Management (International Student Version), 8th ed., Wiley
[Chapter: 5, page 157 to 167]

Textbooks:

1. Mahadevan, B, Operations Management: Theory & Practice, 3rd ed., Pearson Education.
2. Russell& Taylor,Operations & Supply Chain Management (International Student Version), 8th ed., Wiley.
3. MohanMan, GuptaP. K., SwarupKanti, Introduction to Management Science Operations Research, 19th ed. Sultan Chand & Sons.
4. Kapoor V.K., Operations Research: Quantitative Techniques for Management, 9 ed., Sultan Chand & Sons.

Additional Readings:

1. Jay, H. and Barry, R., Operations Management: Sustainability and Supply Chain Management, 12th ed., Pearson Education.
2. Jacobs, F.R., Chase, R.B. and Ravi Shankar, Operations and Supply Chain Management, 14th ed., McGraw Hills.
3. SharmaJ.K., Operations Research: Theory And Applications, 6th ed. Trinity.

PRODUCTION AND OPERATIONS MANAGEMENT

Teaching Learning Process:

Lecture, PowerPoint presentations, discussion, videos, solving numerical problems. Content would be covered through text and relevant cases.

Assessment Methods:

- Internal Assessment: 25 marks
- Written Theory Exam: 75 marks

Keywords:

Operations management, maintenance management, layout, location, capacity, forecasting, aggregate planning, scheduling, statistical quality control, queuing.