FG 201: OPERATIONS MANAGEMENT

Course Objective:

To acquaint students with importance of Operations Management as a specialized body that facilitates the process of Marketing, Finance and Human Resource department in delivering a value product and service.

Learning Outcomes: After the end of the course, students should be able to

- Understand Role and Importance of Operation Manager in an Organization
- Apply Analytical Techniques for Forecasting and Scheduling of jobs and services.
- Understand Six Sigma Quality Standards and Statistical control Charts
- Design and plan models for the firm.

Course Contents:

Unit I   **(3 weeks)**

Introduction to Operations Management: Definition, need, responsibilities, key decisions of Operation Manager. Production vs Operations Management. Operations as a key functional area in an organization.

Operation Strategies-Definition, relevance, strategy formulation process, order qualifying and order winning attribute

Maintenance Management: Need of maintenance management, equipment life cycle (Bathtub curve), measures for maintenance performance (MTBF, MTTR, Reliability and Availability), Reliability of Series and Parallel hardware products.

Lean production: Definition of lean production, lean Demand Pull logic, waste in operations, elements that address elimination of waste, 2 card Kanban Production Control system.

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]

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Unit II (2 weeks)

Process Selection: Definition, Characteristics that influence the choice of alternative processes (volume and variety), type of processes- job shop, batch, mass and continuous, product-process design Matrix and Services design matrix, technology issues in process design, flexible manufacturing systems (FMS), and computer integrated manufacturing (CIM).

Layout Decision: Layout planning ó Benefits of good layout, importance, different types of layouts (Process, Product, Group technology and Fixed position layout). Assembly line balancing by using LOT rule; Location Decisions & Models: Facility Location ó Objective, factors that influence location decision, location evaluation methods- factor rating method and Centre of Gravity Method.

Capacity Planning: Definition, measures of capacity (input and output), types of planning over time horizon. Decision trees analysis

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 (4 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 and Holt Winter method), forecast error, MAD, MSE, MAPE, issues related with forecasting in services, basic idea of technology forecasting. 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) & Johnsonøs rule on two machines, Gantt charts, examples of FCFS, SPT and LPT priority rules in banking and finance.

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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, quality control in finance.

Elementary Queuing Theory: the need of queuing theory in service and manufacturing operations, Poisson- Exponential Single Server Model with Infinite Population.(M/M/1 and M/M/2 queuing models).

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]

Text Books:

1. Mahadevan, B (2015). Operations Management: Theory & Practice, 3rd ed., Pearson Education, New Delhi

2. Jacobs, F.R., Chase, R.B. and Ravi Shankar (2014). Operations and Supply Chain Management, 14th ed., Mcgraw Hills, New Delhi

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

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Additional Readings:

1. Adam,E.E and Ebert, Production & operations Management (latest edition), Prentice Hall of India, New Delhi

2. Gaither and Frazier, Operations Management, (latest edition), Thomson South-Western

3. Operations Research, P. K. Gupta, Man Mohan, KantiSwarup, (latest edition), Sultan Chand and Sons

4. Heizer Jay and Render Barry (2017). Production & Operations Management,12th ed., Pearson Education

5. Fundamentals of Applied Statistics, S. C. Gupta and V. K. Kapoor, (latest edition), Sultan Chand and Sons

Recommendation:

The students are encouraged to solve real life case studies by using software like Excel, and MS Project.

Teaching Learning Process:

Class room lecture, Case study discussion, Numerical Problem solving, Class presentation on the assigned topic by students individually or in group, Workshop, Tutorials, Role play

Assessment Method

1. Internal evaluation of 25% marks
   a. Attendance 5% marks
   b. Two internal evaluations by the teacher with 10% marks each out of which one must be a class test and other may be another test or home assignment or presentation. Faculty may take more than two assignments and (or) tests but total will be only 20% marks.

End term University Exam of 75% marks

Key Words: Lean production, Statistical Quality control, flexible manufacturing systems, order qualifying, quality control