

Course Objectives

Upon course completion, the participants will be able to:

- 1) To gain an understanding and appreciation of the principles and applications relevant to the planning, design, and operations of manufacturing/service firms.
- 2) To develop skills necessary to effectively analyze and synthesize the many inter-relationships inherent in complex socio-economic productive systems.
- 3) To reinforce analytical skills already learned, and build on these skills to further increase your "portfolio" of useful analytical tools for operations tasks.
- 4) To gain some ability to recognize situations in a production system environment that suggests the use of certain quantitative methods to assist in decision making on operations management and strategy.
- 5) To understand how Enterprise Resource Planning and MRPII systems are used in managing operations
- 6) To increase the knowledge, and broaden the perspective of the world in which you will contribute your talents and leadership in business operations.
- 7) To understand the managerial responsibility for Operations, even when production is outsourced, or performed in regions far from corporate headquarters.

Part I – Operations and Production Management in Context

Week 1 – Mod 0: Orientation, instructor background, syllabus overview

- Overview of the entire course
- Grading structure (Critical Reviews, Book Review, Discussions, Projects)
- Web site layout and operation
- Project team formation and operation – Review past projects
- Critical Thinking and Performance Rubric
- Course Value in Career Planning – Levels of Management Thinking

Week 2 – Mod 1: Operations and Production (OPM) Introduction

- What is Operations and Production Management?
- Organizing To Produce Goods and Services
- Why Study OPM?
- What Operations and Production Managers do – Careers
- The Professional Engineer and OPM
- Where are the OPM Jobs?
- Operations in the Service Sector
- New Trends and Operation and Production Management

- The Productivity Issue

Week 3 – Mod 2: OPM - Strategy Development and Implementation

- **Developing Mission and Strategies:** (Mission and Strategy)
- **Achieving Competitive Advantage Through Operations** (Competing on Differentiation, Competing on Cost, Competing on Response)
- **Ten Strategic OM Decisions**
- **Issues in Operations Strategy** (Research, Preconditions, Dynamics)
- **Strategy Development and Implementation** (Identify Critical Success Factors, A Global view of Operations Cultural and Ethical Issues, Build and Staff the Organization, Integrate OM with Other Activities)
- **Global Operations Strategy Options** (International Strategy, Multi-domestic Strategy, Global Strategy, Transnational Strategy)

Part 2 – Designing and Building the Operations Function

Week 4– Mod 3: OPM - Product Design

- Goods and services selection
- Generating new products
- Product development
- Issues for product design
- Time-based competition
- Defining the product
- Documents for production
- Service design

Week 5 - Mod 4: OPM - Plant Location

- **Global company profile: Federal Express**
- **The strategic importance of location**
- **Factors affecting location decisions** (Labor Productivity, Exchange Rates and Currency Risks, Costs, Attitudes, Proximity to Markets, Proximity to Suppliers, Proximity to Competitors (Clustering))
- **Methods of evaluating location alternatives** (The Factor-Rating Method, Location Break-Even Analysis, Center-of-Gravity Method, The Transportation Method)
- **Service Location Strategy** (How Hotel Chains Select Sites, The Telemarketing Industry, Geographic Information Systems)

Week 6 –Mod 5: OPM - Process Design and Plant Layout

- Four Process Strategies
- Process Analysis and Design
- Service Process Design
- Selection of Equipment and Technology
- Production Technology

- Technology is Service Industry
- Environmentally Friendly Processes
- Business Process Reengineering

Part 3 – Operations Control and Productivity

Week 7 – Mod 6: OPM - Work System and Job Design

- **Human resource strategy for competitive advantage**
- **Labor Planning** (Employment-Stability Policies, Work Schedules, Job Classifications and Work Rules)
- **Job Design** (Labor Specialization, Job Expansion, Psychological Components of Job Design, Self-Directed Teams, Motivation and Incentive Systems, Ergonomics and Work Methods)
- **The visual workplace**
- **Labor standards**

Week 8 – Mod 7: OPM - Inventory Management

- **Functions Of Inventory** (Types and classifications of Inventory)
- **Inventory Management** (ABC Analysis, Record Accuracy, Cycle Counting, Control of Service Inventories)
- **Inventory Models** (Independent Versus Dependent Demand, Holding, Ordering, And Setup Costs)
- **Inventory Models For Independent Demand** (Basic Economic Order Quantity (EOQ) Model, Minimizing Costs, Reorder Points, Production Order Quantity Model, Quantity Discount Models)

Week 9 – Mod 8: OPM - MRP / MRPII / ERP

- **MRP Structure**
- **MRP Management** (MRP Dynamics, MRP and JIT)
- **Lot-Sizing Techniques**
- **Extensions of MRP** (Material Requirements Planning, MRP II, Closed-Loop MRP, Capacity Planning)
- **MRP In Services** (Distribution Resource Planning - DRP)
- **Enterprise Resource Planning - ERP** (Advantages and Disadvantages of ERP Systems, ERP in the Service Sector)

Week 10 – Mod 9: OPM- Lean and JIT

- **Global Company Profile: Toyota Motor Corporation**
- **Just-in-Time, the Toyota Production System, and Lean Operations** (Eliminate Waste, Remove Variability, Improve Throughput)
- **Just-in-Time** (JIT Partnerships, Concerns of Suppliers)
- **JIT Layout** (Distance Reduction, Increased Flexibility, Impact on Employees, Reduced Space and Inventory)
- **Just-in-Time** (JIT Partnerships, Concerns of Suppliers)

- **JIT Layout** (Distance Reduction, Increased Flexibility, Impact on Employees, Reduced Space and Inventory)
- **JIT Inventory**
- **Reduce Variability** (Reduce Inventory, Reduce Lot Sizes, Reduce Setup Costs)
- **JIT Scheduling** (Level Scheduling, Kanban system)
- **JIT Quality**
- **Toyota Production System** (Continuous Improvement, Respect for People, Standard Work Practices)
- **Lean Operations** (Building a Lean Organization)
- **Lean Operations in Services**

Week 11 – Mod 10: OPM - Engineering Product Dev & Project Management

- **Engineering to Order Manufacturing Companies**
- **The importance of project management**
- **Project Planning** (The Project Manager, Work Breakdown Structure)
- **Project Scheduling**
- **Project Control**
- **Project Management Techniques: PERT AND CPM** (Network Diagrams and Approaches, Activity on Node Example)
- **Determining the Project Schedule** (Forward Pass, Backward Pass, Calculating Slack Time and Identifying the Critical Path)

Part 4 – Maintaining the Operations and Continuous Improvement

Week 12 – Mod 11- OPM - Maintenance Management

- **The strategic importance of maintenance and reliability)**
- **Reliability** (Improving Individual Components, Providing Redundancy)
- **Maintenance** (Implementing Preventive Maintenance, Increasing Repair Capability)
- **Total Productive Maintenance**
- **Techniques for establishing maintenance policies**

Week 13– Mod 12: OPM - Total Quality Management

- **Quality and Strategy**
- **Defining quality** (Implications of Quality, Malcolm Baldrige National Quality Award, Cost of Quality (COQ))
- **International Quality Standards**
- **Total Quality Management** (Continuous Improvement, Employee Empowerment, Benchmarking, Just-in-Time (JIT), Taguchi Concepts, Knowledge of TQM Tools)
- **Tools of TQM** (Check sheets, Scatter Diagrams, Cause-and-Effect Diagram, Pareto Charts, Flow Charts, Histograms, Statistical Process Control (SPC))
- **TQM in services**

Other Optional Modules

Mod 13. Technology Management

- Mod 14. Computer Integrated Manufacturing (CAD/CAE/CAPP/FMS)
- Mod 15. Aggregate Production Planning
- Mod 16. Sales and Operational Planning
- Mod 17. Forecasting for OPM
- Mod 18: Masters Production Scheduling (MPS)
- Mod 19. Bills of Material Structuring and Management
- Mod 20. Work Centre and Routing Management
- Mod 21. Distribution Resource Planning (DRP)
- Mod 22. Rough Cut Capacity Planning (RCCP)
- Mod 23. Material Requirement Planning
- Mod 24. Short Term Scheduling
- Mod 25. Capacity Requirements Planning
- Mod 26. Purchasing Management
- Mod 27. Production Activity and Shop Floor Control
- Mod 28. Manufacturing Cost Accounting
- Mod 29: Planning, developing, implementing an ERP Manufacturing system
- Mod 30. MRPII / ERP Performance Measurement
- Mod 31. ERP History (MRP – MRP II – ERP – ERP II)
- Mod 32. Supply Chain Management and ERP
- Mod 33. 16 Steps to ERP Success
- Mod 34. ERP ABCD Best Practice Checklist of
- Mod 35. ERP Cost Benefit Analysis
- Mod 36. Achieving Data Accuracy
- Mod 37. Business Process Management
- Mod 38. Product Data / Life Cycle Management
- Mod 39. OPM and Management of Innovation