

# MET-2750: TECHNICAL OPERATIONS MANAGEMENT

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## Cuyahoga Community College

### Viewing: MET-2750 : Technical Operations Management

**Board of Trustees:**

2016-05-25

**Academic Term:**

Fall 2018

**Subject Code**

MET - Mech Eng/Manuf Ind Eng Tech

**Course Number:**

2750

**Title:**

Technical Operations Management

**Catalog Description:**

Introduction to the design and management of manufacturing operations. Emphasis is focused on identifying appropriate management processes and potential management models used to efficiently manage industrial resources. Various techniques and methodologies for solving industrial operations management problems will be explored including statistical models, linear programming, and Microsoft Excel.

**Credit Hour(s):**

3

**Lecture Hour(s):**

2

**Lab Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

MET-2430 Engineering Probability and Statistics or MET-2400 Statistical Quality Control.

## Outcomes

**Course Outcome(s):**

Discuss the role of Operations Management function within an industrial organization.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Identify basic queuing theory and capacity requirements when running an industrial operation.
2. Understand tools available to manage quality and demonstrate use of these tools in an industrial organization.
3. Describe the steps associated with product design development and how it interacts with an industrial operations function.

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**Course Outcome(s):**

Apply the use of appropriate terminology and descriptions within Industrial Operations Management.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Configure MS Excel Spreadsheets to model industrial operations.

2. Describe the steps associated with product design development and how it interacts with an industrial operations function.

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**Course Outcome(s):**

Define basic operations management problems and provided potential solutions to solve the problem.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain and use statistical models when modeling a basic industrial operation.
2. Formulate basic industrial operations using linear programming.
3. Configure MS Excel Spreadsheets to model industrial operations.
4. Identify basic queuing theory and capacity requirements when running an industrial operation.

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**Course Outcome(s):**

Utilize a set of basic tools and skills used in solving problems traditionally associated with Operations Management.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain and use statistical models when modeling a basic industrial operation.
2. Formulate basic industrial operations using linear programming.
3. Configure MS Excel Spreadsheets to model industrial operations.
4. Identify basic queuing theory and capacity requirements when running an industrial operation.
5. Understand tools available to manage quality and demonstrate use of these tools in an industrial organization.
6. Describe the steps associated with product design development and how it interacts with an industrial operations function.

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**Course Outcome(s):**

Interface with the other parts of a manufacturing organization, such as marketing, procurement & sourcing, outsourced goods & services and industrial customers, while performing operations management duties.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Demonstrate usage of software packages for managing inventory.
2. Describe the relationships between components of the global supply chain, costing elements, cultural differences, and methods of contracting between components.
3. Identify basic queuing theory and capacity requirements when running an industrial operation.
4. Understand tools available to manage quality and demonstrate use of these tools in an industrial organization.
5. Describe the steps associated with product design development and how it interacts with an industrial operations function.
6. Describe and demonstrate the use of quality management systems and lean systems.
7. Evaluate job roles using Department of Labor Data, write a job description, and describe methods of training.
8. Demonstrate the use of project management tools including Microsoft Excel and Microsoft Project.

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**Methods of Evaluation:**

Course Project  
Midterm and Final Exam  
Homework Assignments  
Case Studies

**Course Content Outline:**

1. Introduction to Industrial Operations Management
  - a. Role of Industrial Operations
  - b. Strategies

- c. Policies
- 2. Quality Management
  - a. Definition of Quality
  - b. Quality Statistical Models
  - c. Tools available for Quality
  - d. TQM and QMS
  - e. Six Sigma
  - f. Costs Associated with Quality
  - g. Statistical Process Control
- 3. Product Design
  - a. Design Process
  - b. Feasibility Studies
  - c. Rapid Prototyping and Concurrent Design
  - d. Design of Experiments
  - e. Modeling in Excel
- 4. Processes and Technology
  - a. Process Planning
  - b. Process Analysis
  - c. Process Innovation
  - d. Technology Decisions
- 5. Capacity and Facilities
  - a. Capacity Planning
  - b. Facilities
  - c. Layout of Facilities
  - d. Introduction to Models available
- 6. Human Factors
  - a. Training
  - b. Role of Individuals
  - c. Job Analysis and Design
  - d. Learning Curves
- 7. Project Management
  - a. Project Planning
  - b. Modeling Risk in Project Planning using Statistical Models
  - c. Project Scheduling
  - d. Project Control
  - e. Microsoft Project and other software
- 8. Supply Chain Management Strategy and Design
  - a. Types of Industrial Supply Chains
  - b. Distribution Centers and Warehouse Management
  - c. Logistics
- 9. Global Supply Chain Procurement and Distribution
  - a. International Laws and Customs
  - b. Modes of Transportation
  - c. Modeling Cost Systems
- 10. Inventory Management
  - a. Ordering Models
  - b. Inventory Control Systems
  - c. Quantity Discounts and Decisions
- 11. Lean Systems
  - a. Statistical Models
  - b. Risks versus Rewards
  - c. Lean Six Sigma

d. Importance of Scheduling

**Resources**

Russell, Roberta S. Bernard W. Taylor III. *Operations and Supply Chain Management*. 8th. Hoboken, NJ: John Wiley Sons, Inc., 2014.

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Stevenson, William J. *Operations Management*. 12th. NA: McGraw Hill, 2015.

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**Resources Other**

Advanced Topics in Applied Operations Management. ISBN: 978-953-51-0345-5 Open Access Text: <http://www.intechopen.com/books/advanced-topics-in-applied-operations-management>

Quality Assurance and Management. ISBN: 978-953-51-0378-3 Open Access Text: <http://www.intechopen.com/books/quality-assurance-and-management>

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