Instructor: Ed Palacio   Email: eduardo.palacio@stonybrook.edu


Course Description
This course will lay the foundation for an understanding of Operations Management principles for Engineers. Operations Management is the art of transforming ideas and materials into true value-added for company stakeholders. In this course, we will explore the entire value chain from design to forecasting to supply chain management, production and quality control. We will look at the latest trends in global Operations theory, but will not forget the basics of good management. We will use several case studies to get real-world experience and emphasize situational learning. We will also discuss several quantitative methods for analyzing and controlling cost, lead-time, and quality of the goods or services being produced.

This is an introductory analysis of productive systems, operations planning and control. Topics include forecasting, product and process strategies, location and layout analysis, inventories and just-in-time systems, materials requirement planning, and project management. We will discuss several quantitative methods for analyzing and controlling cost, lead time, and quality of the goods or services being produced.

Course Format and Student Responsibilities
The course is conducted using in-person lecture with active class discussion expected. Thorough preparation and individual class participation are required. Students are responsible for (i) reading each session’s required readings in advance of the class session, (ii) contributing to class discussions, and (iii) completing weekly homework assignments, usually chapter-end problems from the textbook. No web surfing is allowed during class.
Exams:
There will be a midterm exam and a final exam. During exams, students may refer to the textbook, but electronic devices are not permitted in the exam room. Dates of exams will be announced.

Tentative Meeting Schedule:

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Day of week</th>
<th>Time</th>
<th>Topics</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>8/28</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Product/Operations Mgmt. Ch. 1</td>
</tr>
<tr>
<td>2</td>
<td>9/4</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Operational Strategy Ch. 2 &amp; Ch. 7</td>
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<tr>
<td>3</td>
<td>9/11</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Process Strategy and Capacity Planning Ch. 7/7S</td>
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<td>4</td>
<td>9/18</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Forecasting Ch. 4</td>
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<td>5</td>
<td>9/25</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Locations Strategy Ch. 8</td>
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<tr>
<td>6</td>
<td>10/2</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Operations Layout Strategy Ch. 9</td>
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<tr>
<td>7</td>
<td>10/16</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Job Design Ch. 10</td>
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<td>8</td>
<td>10/23</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Midterm Ch. 1,2,4,7,8,9, and 10</td>
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<td>9</td>
<td>10/30</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Supply Chain Mgmt. Ch. 11/11S</td>
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<td>10</td>
<td>11/6</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Inventory Mgmt. Ch. 12</td>
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<tr>
<td>11</td>
<td>11/13</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Planning (Aggregate &amp; MRP) Ch. 13/14</td>
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<td>12</td>
<td>11/20</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Lean and JIT Ch. 16</td>
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<td>13</td>
<td>11/27</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Scheduling Ch. 15</td>
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<tr>
<td>14</td>
<td>12/4</td>
<td>Tuesday</td>
<td>7-10 PM</td>
<td>Maintenance and Reliability Ch. 17</td>
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<tr>
<td>15</td>
<td>TBS</td>
<td>TBS</td>
<td>TBS</td>
<td>Final Exam Ch. 11 through 16</td>
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Session topics with required readings and learning objectives*
*Subject to change according to class progress

Session 1
Production/Operations Management (Ch. 1)

- Identify or define:
  - Production and productivity
  - Production/Operations Management (P/OM)
  - What production/operation managers do
  - The three major functions of a business

- Describe or Explain:
  - A brief history of operations management
  - Career opportunities in production/operations management
  - The future of the discipline
**Session 2 & 3  Operations and Process Strategy (Ch. 2, 7, 7S)**

- Identify or define:
  - Process focus
  - Product focus
  - Repetitive focus
- Explain:
  - Lean production
  - The capacity issue
  - Break-even analysis
  - Financial considerations
  - Strategy-driven investments
- Identify or define:
  - The Internet
  - Computer-aided design (CAD)
  - Computer-aided manufacturing (CAM)
  - Various production technologies
  - Enterprise Resource Planning (ERP)
- Explain:
  - The role of the Internet in operations
  - Virtual reality in operations
  - Flexible manufacturing systems
  - Computer-integrated manufacturing (CIM)
  - Manufacturing uses of MIS

**Session 4  Forecasting (Ch. 4)**

- Identify or define:
  - Forecasting
  - Types of forecasts
  - Time horizons
  - Approaches to forecasts
- Explain:
  - Moving averages
  - Exponential smoothing
  - Trend projections
  - Regression and correlation analysis
  - Measures of forecast accuracy

**Session 5  Location Strategies (Ch. 8)**

- Identify or define:
  - Objective of location strategy
  - International location issues
**Session 6 & 7**  
**Operations Layout Strategy & Job Design (Ch. 9, 10)**

- Explain:
  - Three methods of solving location problem
    - Factor-rating method
    - Locational break-even analysis
    - Center-of-gravity method

- Identify or define:
  - Fixed-position layout
  - Process-oriented layout
  - Work cells
  - Focused work center
  - Retail/service layout
  - Warehouse layout
  - Product-oriented layout
  - Assembly line factory

- Explain:
  - How to achieve a good layout for the process facility
  - How to balance production flow in a repetitive or product-oriented facility

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**Session 8**  
**MIDTERM EXAMINATION**

The midterm examination will include problems from chapters 1, 2, 4, 7, 8, 9, and 10. Each student will work individually to arrive at the solutions to these problems. The midterm examination carries **33 marks**.

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**Session 9**  
**Supply Chain Management (Ch. 11 & 11S)**

- Identify or define:
  - Supply-chain management
  - Purchasing
  - E-procurement
  - Materials management
  - Keiretsu
  - Virtual companies

- Explain:
  - Purchasing strategies
  - Approaches to negotiations

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**Session 10**  
**Inventory Management (Ch. 12)**

- Identify or define:
  - ABC analysis
Cycle counting  
Holding, ordering, and setup costs  
Independent and dependent demand  
Record accuracy

- Explain:
  The functions of inventory and basic inventory models

**Session 11**  **Planning (Aggregate & MRP) (Ch. 13, 14)**

- Identify or define:
  Lot-sizing  
  Low-level coding  
  Planning bills, pseudo bills, and kits  
  Phantom bills

- Explain:
  Material requirement planning  
  Distribution requirements planning

**Session 12**  **Lean Production and JIT (Ch. 16)**

- Identify or define:
  Types of waste  
  Variability  
  Kanban

- Explain:
  Just-in-time philosophy  
  Pull systems  
  Push systems  
  The goals of JIT partnerships  
  The impact of JIT on layout  
  How JIT affects quality and employees

**Session 13**  **Scheduling (Ch. 15)**

- Identify or define:
  Set-up costs and their role in lot size determination and machine scheduling

- Explain:
  Forward and backward scheduling  
  Effective or optimal assignment of products to machines
Session 14  Maintenance & Reliability (Ch. 17)

- Identify or define:
  - Optimal replacement schedules
  - Optimal maintenance schedules
  - Design for repair

Session 15  FINAL EXAMINATION

The final examination will include problems from chapters 11, 11S, and 12 through 16. Each student will work individually to arrive at the solutions to these problems. The final examination carries 33 marks.

WEEKLY ASSIGNMENTS: Homework problems will be identified during class.

MARKS ALLOCATION SUMMARY

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Homework Assignments</td>
<td>24</td>
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<tr>
<td>Mid-term (Individual effort)</td>
<td>33</td>
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<tr>
<td>Final Examination (Individual</td>
<td>33</td>
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<tr>
<td>effort)</td>
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<tr>
<td>Overall Participation</td>
<td>10</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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</table>

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/cmmc5/academic_integrity/index.html

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