STATE UNIVERSITY OF NEW YORK AT STONY BROOK
COLLEGE OF ENGINEERING AND APPLIED SCIENCES

FALL Semester 2018
Strategic Technology Analysis
EMP 506
Course Syllabus

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

Text: Jay Heizer and Barry Render: *Principles of Operations Management*, 12th Edition, Prentice Hall.

Additional required reading: Eliyahu M Goldratt: *The Goal – A Process of Ongoing Improvement.* You can buy this book anywhere, paperback edition, quite inexpensively. This is a classic book for Operations Management students dealing with the Theory of Constraints.

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:

Session	*Date*	*Day of week*	*Time*	Topics
1	8/28	Tuesday	7-10 PM	Product/Operations Mgmt. Ch. 1
2	9/4	Tuesday	7-10 PM	Operational Strategy Ch. 2 & Ch. 7
3	9/11	Tuesday	7-10 PM	Process Strategy and Capacity Planning Ch. 7/7S
4	9/18	Tuesday	7-10 PM	Forecasting Ch. 4
5	9/25	Tuesday	7-10 PM	Locations Strategy Ch. 8
6	10/2	Tuesday	7-10 PM	Operations Layout Strategy Ch. 9
7	10/16	Tuesday	7-10 PM	Job Design Ch. 10
8	10/23	Tuesday	7-10 PM	Midterm Ch. 1,2,4,7,8,9, and 10
9	10/30	Tuesday	7-10 PM	Supply Chain Mgmt. Ch. 11/11S
10	11/6	Tuesday	7-10 PM	Inventory Mgmt. Ch. 12
11	11/13	Tuesday	7-10 PM	Planning (Aggregate & MRP) Ch. 13/14
12	11/20	Tuesday	7-10 PM	Lean and JIT Ch. 16
13	11/27	Tuesday	7-10 PM	Scheduling Ch. 15
14	12/4	Tuesday	7-10 PM	Maintenance and Reliability Ch. 17
15	To be scheduled	TBS	TBS	Final Exam Ch. 11 through 16

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

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

Session 6 & 7 **Operations Layout Strategy & Job Design (Ch. 9, 10)**

- 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

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.**

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

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

Homework Assignments		24 Marks
Mid-term	(Individual effort)	33 Marks
Final Examination	(Individual effort)	33 Marks
Overall Participation		10 Marks
Total		**100 Marks**

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/commcms/academic_integrity/index.html

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.