

BUS 3040

Operations Management

Spring 2011

Bogue 019

Monday & Thursday (11:00am – 12:15pm)

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Course Overview

Operations—the nuts and bolts of how a company creates and provides valuable products and services to its customers—has always been an important source of strategic advantage for firms. The ability to respond to changing consumer and market requirements quickly, at low cost, and with high quality is vital to attaining profitability and growth through increased market share.

Today, we are witnessing a profound transformation in the field of Operations Management as companies are moving towards more sustainable business models. In this new era, companies are redesigning their operations to eliminate their environmental footprint and restore social capital. To succeed, operations managers will need to expand their horizons and adopt a broader systems perspective in which they consider the long-range consequences of their business practices on the environment, local communities and our global society.

The goal of this course is to provide you with an understanding of this evolving operations function. Through a combination of case studies, textbook, video, readings, exercises and simulations you will develop the basic skills necessary to critically analyze and evaluate a firm's operating performance and practices. You will then work together in teams and apply what you learn—about service/process design, supply chain management, quality improvement, and resource planning—to redesign an area of operations here at Green Mountain College.

Course Learning Objectives

As a result of the experiences, readings, and discussions in this class, you will be able to:

- Demonstrate an understanding of the core areas of Operations Management, including: operations strategy, product/service design, supply chain management, process design, quality improvement, project management, forecasting, capacity and planning.
- Describe how the elements of operations combined with an organization's culture (i.e. people) work together as a *system* to determine the quality, cost and on-time delivery of goods and services and, ultimately, a firm's competitive advantage.
- Explain how a systems approach to supply chain management, combined with social and environmental stewardship, can help move companies towards sustainable business practices.
- Apply tools and methods of quality improvement to determine the root causes of operational problems and identify potential areas for improvement. Design operational improvements that reduce sources of variability and waste and improve overall performance.
- Create more flexible plans that account for uncertainties, while avoiding over-planning and over-reacting to changing conditions.
- Communicate about complex operational issues in ways that promote shared understanding and collaborative problem-solving.

Course Requirements and Grading

Your course grade will be based on the following assessments:

Percent	Assessment	Requirement
15%	Case studies and other written assignments	Individual writing assignments will include several case study analyses (approx. 1,000 words each) and personal reflections about class learning experiences (approx. 500 words each).
20%	In-class quizzes (8)	Short quizzes (15 – 20 minutes) will be used throughout the semester to assess your understanding of key terms, concepts and course material. The format will vary: multiple choice, fill-in the blank, problems or short written responses. Quizzes cannot be made up if you miss class.
10%	Midterm Exam	This exam will include a quiz-like component as well as a written response to a brief case study. This exam cannot be made up.
30%	Group project	You will work with a small group to analyze an operational area on the GMC campus and make recommendations for improvement. Requirements include: five intermediate reports, a final summary report and an oral presentation. See below for more details.
10%	Class participation	You are expected to attend all classes, contribute and fully participate in all activities and treat your classmates with respect. In-class activities cannot be made up. If you miss a class, it is your responsibility to keep up with any material we cover.
15%	Final Case Study Paper	In lieu of an in-class final exam, you will provide a written analysis and recommendations based on an assigned case study.

Grading scheme:

95% - 100%	A
90% - 94%	A-
87% - 89%	B+
84% - 86%	B
80% - 83%	B-
77% - 79%	C+

73% - 76%	C
70% - 72%	C-
67% - 69%	D+
64% - 66%	D
60% - 63%	D-
0% - 59%	F

Note: Partial points will be rounded to the nearest full point, e.g. 83.4% = 83%, which leads to a grade of B-; 83.5% = 84% which leads to a grade of B.

Group Project: Redesigning Operations at GMC

A great way to learn about how operational systems work is to study a real one in depth and explore ways of improving it. In this course, you will work with a small group (3 – 4 students), and together you will select an area of operations at Green Mountain College to study in depth. For example, you might choose to study Chartwell’s dining and catering operations, campus facilities maintenance, the biomass plant operations, the campus bookstore or even the admissions process (all subject to approval by me and the appropriate GMC managers). You will then proceed through the following steps to analyze possible sources of waste and inefficiency and design improvements that will save costs, improve customer service, and benefit the environment and our campus community:

- 1. Proposal.** In this phase your group will choose an operational area at GMC that you feel would benefit from improvement. You will use the principle of “go and see” to observe how well processes are working from the perspectives of the various stakeholders. You will then define and scope the problem you are trying to solve.
- 2. As-is process map.** In this phase, you will map out the main steps of the operational process on campus—as it currently works—and identify sources of waste. These can include unnecessary activities that do not add value to the end customer of the process, wasteful use of materials or energy and creation of pollution and solid waste.
- 3. Supply chain analysis.** Here you will look at the bigger picture, at the material and information flows beyond the GMC campus that determine the performance of your operational system. This can include a “cradle-to-grave” look at material and information sourcing and disposal, as well as any recycling or reuse of these resources.
- 4. Root cause analysis.** Using the approach of asking “Why?” five times, along with other analytical techniques we learn in class, you will look for the root causes of waste in your system. By taking a “systems” approach toward analysis, you will identify a few critical areas where improvements would have the greatest impact on performance.
- 5. Process improvement plan.** Finally, you will identify specific ways that your operational area can be improved and redesign key processes to create a “to be” process map. You will recommend a plan that can be implemented to achieve your targeted improvements.
- 6. Final presentation.** You will compile each component of your study above into a final written report. You will also give an oral presentation of your analysis and recommendations to our class and to any interested campus managers at the conclusion of the semester.

Course Materials

Required text:

Heizer, Jay and Barry Render (2011), *Operations Management (10th Edition)*. Boston: Prentice Hall. ISBN-13: 978-0-13-611941-8.

Supplementary materials:

Supplemental course materials/handouts, case studies and video resources will be provided in class and/or via Epsilon. We will use additional readings to explore several topics in greater depth than the text. These include journal articles and excerpts from the following books:

Graedel, T. E. and Allenby, B. R. (2003), *Industrial Ecology (2nd Edition)*. Upper Saddle River, NJ: Pearson Education, Inc.

Liker, Jeffrey K. (2004), *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York: McGraw-Hill.

Liker, Jeffrey K. and Michael Hoseus, *Toyota Culture: The Heart and Soul of the Toyota Way*. New York: McGraw-Hill.

Meredith, Jack R. and Scott M. Shafer (2010), *Operations Management for MBAs (4th Edition)*. Hoboken, NJ: John Wiley & Sons.

Pande, Peter S., Robert P. Neuman and Roland R. Cavanagh (2002), *The Six Sigma Way Team Fieldbook: An Implementation Guide for Process Improvement Teams*. New York: McGraw-Hill.

Sterman, John D. (2000), *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Boston: Irwin McGraw-Hill.

Unrun, Gregory (2010), *Earth, Inc.: Using Nature's Rules to Build Sustainable Profits*. Boston: Harvard Business Press.

Womack, James P. and Daniel T. Jones (2003), *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York: Free Press.

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Case studies used in this course include:

Sasser, W. Earl (2004, July 20). *Benihana of Tokyo*. Harvard Business School Publishing Case # 9-673-057.

Hamprecht, Jens and Daniel Corsten (2006). *Migros—Sustainable Supply Chain Strategy (A): Working with WWF and ProForest towards a Palm Oil Standard*. London Business School reference CS 06-016. ECCH Case 606-045-1.

Donnelon, Anne and Susan Engelkemeyer (2004, Nov 29). *Quality at Gillette Argentina*. Babson College Case BAB003.

You will also participate in several in-class simulations. One of these will be an online simulation:

Sasser, W. Earl, Jr. and Ernst, Ricardo (2009, July 1). *Operations Management Simulation: Benihana*. Harvard Business School Publishing Simulation #2653-HTM-ENG.

Course Policies

All Green Mountain College academic policies apply to this course. In terms of behavioral guidelines: honesty, openness, respect, integrity and effort will go a long way toward helping you learn in ways that will enrich your life. John Madden, former coach of the NFL Oakland Raiders, and Super Bowl XI winner had three deceptively simple rules that he asked his players to follow:

- 1) Be on time.
- 2) Pay attention.
- 3) Do your best.

Let's all work hard to create a great learning environment together!

Class Attendance. Research shows that class attendance is a primary determinant of student success. You are expected to attend EVERY class. If you know that you must miss class due to an illness, sports activity or other reason, you are expected to inform me by email in advance. You are still expected to turn in all assignments on time, using Epsilon drop boxes (see below).

Class Participation. I expect everyone to contribute to our class discussions and activities. Learning how to contribute to a group discussion is a critical business skill. Some of you may find it more challenging than others to speak up in a large group setting. Others may need to learn to speak less and listen more. I'll work to create a safe environment for learning, but you will also need to take some risks, try new behaviors and be open to feedback. Please don't feel like you need to know "the answer" before you speak in this class. There are no dumb questions (if sincere). Often, asking a naive question, or describing what you're confused about, will advance a discussion much more than espousing what you are already certain about.

Written Assignments. You need to submit written assignments in both printed and electronic form (using Epsilon drop boxes). I will collect printed copies of written assignments at the beginning of class on the day they are due. Only you (not your classmate) can turn in your assignment. NOTE: If you are late to class, your assignment is late! Late assignments will be penalized by 10% for each day the assignment is late. There are no exceptions to this policy.

Missed activities, quizzes, midterm or final. There are no make-ups for missed classroom activities or quizzes. If you do not show up to class, you get a zero (unless you have prior written permission from me).

Accommodations. If you have a specific learning, physical or psychiatric disability and require accommodations, please let me know within the first two weeks of the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Calhoun Learning Center. The Calhoun Learning Center is the office responsible for coordinating accommodations for students with disabilities. The Calhoun Learning Center is located on the 3rd floor of Griswold Library. If you have questions, please contact Christina Fabrey at x8234.

Course Schedule

***Note: this schedule is subject to change. See Epsilon for any schedule changes during the semester.**

Date	Topic; <i>Focusing question;</i> In-class activities	Reading Due	Assignment Due; Assessment
Part I: Introduction to Operations Management			
Monday, January 17	Course introduction; <i>What do you want to learn from this course? What is Operations Management?</i> Discuss learning objectives, outline projects.		
Thursday, January 21	Operations and productivity; <i>What do operations managers do?</i> Explore careers and salaries	Heizer and Render, Chapter 1	Survey of learning goals, style; math assessment
Monday, January 24	Meet in Griswold Library, PC Lab		
	Experiencing operations; <i>How do strategic decisions about operations determine profitability?</i> Benihana simulation	Benihana Case	Benihana Case Study summary (Team project proposal assigned)
Thursday, January 27	Meet in Griswold Library, PC Lab		
	Experiencing operations (cont.) Benihana simulation	Porter, Michael A. (1996), "What is Strategy?," <i>Harvard Business Review</i> (Nov-Dec), pp. 61-78.	Benihana simulation analysis
Monday, January 31	Operations strategy; <i>How can companies achieve a competitive advantage through operations?</i>	Heizer and Render, Chapter 2	Activity System Map for GMC Quiz 1
Part II. Designing Operations			
Thursday, February 3	Design of goods and services; <i>How do companies develop new products and services that succeed in the marketplace?</i>	Heizer and Render, Chapter 5	Chapter 5 problems
Monday, February 7	Decision analysis; <i>How do you make decisions about new products when the possible outcomes are uncertain?</i>	Heizer and Render, Module A	Team project: proposal due Module A problems

Date	Topic; <i>Focusing question;</i> In-class activities	Reading Due	Assignment Due; Assessment
Thursday, February 10	Design for Environment (DfE); <i>How do you design products and services to benefit the environment?</i> Video: Interface carpet	McDonough, William, Michael Braungart, Paul T. Anastas and Julie B. Zimmerman (2003), "Applying the Principles of Green Engineering to Cradle-to-Cradle Design," <i>Environmental Science & Technology</i> , Dec. 1, pp. 434-441A. Unrun, <i>Earth, Inc.</i> , "Value Cycles: Use Nature's Value-Adding Self-Sustaining Cycle to Revolutionize Your Value Chain."	Quiz 2
Monday, February 14	Process strategy and sustainability; <i>How do you design a process to deliver value and be sustainable?</i>	Heizer and Render, Chapter 7	Chapter 7 problems (Team project: As-is process map assigned)
Thursday, February 17	Value Stream Mapping; <i>How do you identify where value is added in a process?</i> Teams: Starting the As-is map	Meredith and Shafer, <i>Operations Management for MBAs</i> (4 th Ed.), pp. 184-190. Womack and Jones, <i>Lean Thinking</i> , Chapter 1, "Value," pp. 29-36. "Lean and Clean Value Stream Mapping," Green Suppliers Network, www.greensuppliers.gov	Quiz 3
Monday, February 21	Life Cycle Assessment (LCA); <i>How do you assess the overall impact of a product or service on the environment?</i> Teams: Adding environmental impacts to the value stream map	Graedel and Allenby, <i>Industrial Ecology</i> , Chapter 15, "An Introduction to Life Cycle Assessments"; Chapter 17, "Streamlining the LCA Process" Zabaniotou, A. and E. Kassidi (2003), "Life cycle assessment applied to egg packaging made from polysterene and recycled paper," <i>Journal of Cleaner Production</i> 11, pp. 549-559.	Case Study: Migros Sustainable Supply Chain Strategy (A)
Part III. Supply and Inventory Management			
Thursday, February 24	Supply-chain management; Why do integrated supply chains provide a strategic advantage to companies?	Heizer and Render, Chapter 11	Chapter 11 problems Team project: As-is value stream map due Quiz 4

Date	Topic; <i>Focusing question;</i> In-class activities	Reading Due	Assignment Due; Assessment
Monday, February 28	Green supply chains and waste = food; <i>How do closed-loop supply chains work?</i>	Larson, Andrea (2009, Oct 21). "Green Supply Chains." Darden Business Publishing article UV2048. Ehrenfeld, John and Nicholas Gertler (1997), "Industrial Ecology of Interdependence at Kalundborg," <i>Journal of Industrial Ecology</i> 1/1, pp. 67-79.	(Team project: supply chain analysis assigned)
Thursday, March 3	MIDTERM		The midterm will cover all material so far.
Monday, March 7	SPRING BREAK		
Thursday, March 10	SPRING BREAK		
Monday, March 14	Meet in Griswold Library, PC Lab		
	Inventory management; <i>How do you ensure that you have enough supply to satisfy demand, but not too much?</i> Simulation: constant demand	Heizer and Render, Chapter 12	Chapter 12 problems
Thursday, March 17	Meet in Griswold Library, PC Lab		
	Variable demand and safety stock; <i>How do you account for variability when managing inventory levels?</i> Simulation: variable demand		Add'l Chap 12 problems
Part IV. Process Improvement			
Monday, March 21	Managing Quality; <i>How do you create a system that produces high quality products and services?</i>	Heizer and Render, Chapter 6	Chapter 6 problems Team project: supply chain analysis due Quiz 5
Thursday, March 24	Applying tools of TQM; <i>How do you determine the root cause of quality problems?</i> Team: Apply TQM tools to analyze processes	Pande et al, <i>The Six Sigma Way Fieldbook</i> , Chapter 12, "Analyzing Data and Investing Causes"	(Team project: process redesign assigned)
Monday, March 28	Applying tools of TQM (cont.): Team: Apply TQM tools to analyze processes		

Date	Topic; <i>Focusing question;</i> In-class activities	Reading Due	Assignment Due; Assessment
Thursday, March 31	Eliminating waste through Lean; How do you eliminate the steps in a process that don't add value to the customer? Team: Start future state map	Heizer and Render, Chapter 16, pp. 620-635 Womack and Jones, <i>Lean Thinking</i> , Chapter 3, "Flow," pp. 50-66.	Chapter 16 problems Quiz 6
Monday, April 4	Just-in-time; How do you reduce the level of inventory needed to ensure reliable delivery to customers? Production line simulation	Womack and Jones, <i>Lean Thinking</i> , Chapter 4, "Pull," pp. 67-89. Liker, <i>The Toyota Way</i> , Chapter 9, "Principle 3: Use 'Pull' Systems to Avoid Overproduction," pp. 104 – 112.	
Thursday, April 7	Toyota Production System; <i>What enables improvement systems to work? Can these same principles be used to move operations towards sustainability?</i>	Heizer and Render, Chapter 16, pp. 635-639 Liker and Hoseus, <i>Toyota Culture</i> , Preface, Chapter 1.	Case analysis: Quality at Gillette Argentina
Part V: Planning and Scheduling			
Monday, April 11	Project management; <i>How do you manage a large project so that it gets completed on time and within budget? How do you identify the critical path tasks?</i>	Heizer and Render, Chapter 3	Chapter 3 problems Team project: Process Redesign due Quiz 7
Thursday, April 14	Project management (cont.); <i>Why do projects often finish late and run over budget?</i>	Sterman, "On time and under budget: the dynamics of project management," in <i>Business Dynamics</i> , pp. 55 - 66	Case study: Hard Rock's Rockfest
Monday, April 18	Meet in Griswold Library, PC Lab		
	Forecasting; <i>How do companies estimate future demand for their products and services?</i> Excel tools for forecasting	Heizer and Render, Chapter 4	Chapter 4 problems (Team project: Planning and scheduling assessment assigned)
Thursday, April 21	Capacity and Bottlenecks; <i>How can you identify and manage the bottleneck in a process?</i> TOC simulation	Heizer and Render, Supplement 7	Supplement 7 problems Quiz 8
Monday, April 25	EASTER HOLIDAY		
Thursday, April 28	Planning; <i>How do you make sure the required resources are in place to satisfy uncertain future demand?</i>	Heizer and Render, Chapter 13	Chapter 13 problems (Take-home final assigned)

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Date	Topic; <i>Focusing question;</i> In-class activities	Reading Due	Assignment Due; Assessment
Monday, May 2	Review and wrap-up; What have you learned?		Team project: Planning and scheduling assessment due
Saturday, May 7 3:30 – 5:30pm	FINAL EXAM: Team Project Presentations		Final Project team presentations and take-home finals due Friday May 6, 11:59pm.