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Course Meetings: Saturday, 1:30pm-4:30pm, TBA  
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Course Description and Objectives  
This course provides a general introduction to operations management. Operations management is the design and control of business processes, that is, the recurring activities of a firm. Along with finance and marketing, operations is one of the three primary functions of a firm. At the risk of being simplistic, one may say that marketing generates the demand, finance provides the capital, and operations produces the product or delivers the service. More generally, operations spans the entire organization: COOs are in charge of R&D, design/engineering, production operations, marketing, sales, support and service.  

This course aims to (1) familiarize you with the major operational problems and issues that confront managers, and (2) provide you with language, concepts, insights and tools to deal with these issues in order to gain competitive advantage through operations.  

This course should be of particular interest to people aspiring a career in designing and managing business processes, either directly (V.P. of Ops, COO) or indirectly (e.g., management consulting). The course should also be of interest to people who manage interfaces between operations and other business
functions such as finance, marketing, managerial accounting and human resources. Finally, a working knowledge of operations, which typically employs the greatest number of employees and requires the largest investment in assets, is indispensable for general managers and entrepreneurs.

We will see how different business strategies require different business processes, and vice versa, how different operational capabilities allow and support different strategies to gain competitive advantage. A process view of operations will be used to analyze different key operational dimensions such as capacity management, flow time (cycle time) management, and supply chain management.

**Required Texts**

Required materials available at the bookstore:

1. Course Pack.

Cases listed in the class-by-class reading list below are found in the Course Pack.

As a novel, *The Goal* is light reading and some sections are quite entertaining. Nevertheless, it is well over 300 pages long, so you are encouraged to start reading now. We will draw on it during the entire course and there may be questions based on the book on the exams.

**Grading**

The grade you receive for the course is intended to certify your demonstrated proficiency in the course material. Proficiency will be estimated by measuring your performance on class contribution, written team assignments and individual exams. The midterm exam will be in class, closed-book. The final will be a three-hour, in-class exam with open readings, open class handouts and notes. It will be comprehensive, covering material from all course modules. It will only be available during the exam period.
Your course grade will be based on a weighted evaluation of the following categories:

1. Class contribution 10%
2. Case write-ups and concept checks 20%
3. Littlefield Technologies 10%
4. Midterm examination 20%
5. Comprehensive final examination 40%

- The midterm is an optional/dropable exam. That is, the 20% of your course grade allocated to the midterm exam will be determined as the better of your midterm and final exam grades.
- If for any reason you cannot take the midterm exam at the scheduled time, I will shift the 20% onto your final exam, i.e. your final will be worth 60%. I strongly discourage you from using this option unless it is absolutely unavoidable.

**Preparing for Class**

Course assignments are designed to engage you in the issues, to teach you ways to think about and analyze operational problems. The enclosed course outline and detailed schedule provides you, class by class, with a brief description of the class, the readings and the assignments.

**Case Write-Ups and Concept Checks**

All case write-ups and concept check assignments are to be done in groups. Please form groups of 4-5 students as soon as we start. (The first assignment is due at the second lecture!)

The goal of the team approach to case prep is to have you think and experiment while sensitizing you to those issues that are novel and that will be further discussed in class. On the case write-ups you are only required to answer the questions given in the assignment by the instructor. You are not required to analyze the cases and make general recommendations unless explicitly asked. Submit your team’s write-up and concept check assignments through Canvas. Be punctual: Late submissions will not be accepted.
The Kellogg Honor Code stipulates that you may put your name on the submission only if you contributed to the group discussion.

The Kellogg Honor Code also stipulates that you may not use any outside materials in preparing the case write-ups. This includes (but is not limited to) handouts from past terms and materials found on the Internet.

Littlefield Technologies Simulation

Near the end of the quarter, we will play the Littlefield Technologies simulation. Teams will compete against each other in managing an operation. The team whose factory has the largest cash position at the end of the game wins. More details will be given in the assignment, to be posted on Canvas.

- When you log in for the first time, you must enter your full name as it appears on the registrar’s records.
- Your grade will be based on a combination of your final cash position, relative to other teams and your post-game write-up. A good post-game write-up will provide a detailed analysis and justification of your strategy for playing the game.
- Any group that exerts little or no effort in playing the game will receive a grade of zero, regardless of the quality of the write-up.

Class Contribution

In-class contribution will consist mainly of voluntary contributions, although I may cold-call to encourage broader participation. You should find a seat you are comfortable with and stay there the entire quarter. This will help me in assessing student contribution correctly. Use your name card every class.

Classroom Etiquette

The Kellogg Code of Classroom Etiquette can be found at http://www.kellogg.northwestern.edu/stu_aff/policies/etiquette.htm.

This etiquette policy was developed by students to foster an atmosphere that is conducive to collective learning. While attendance for any given class session is not compulsory (though encouraged), students’ compliance with the Kellogg classroom etiquette policy will be enforced.
In particular, you may not:

1. Engage in cross-talking.
2. Engage in disruptive movement (e.g., arrive late, leave class for a coffee or snack).
3. Use a smart phone or other device for texting, e-mail etc.
4. Indulge in any other behavior that may be deemed by other students or the instructor to be inappropriate or inconsistent with Kellogg Code of Classroom Etiquette.

A laptop or tablet may be used only for note taking or accessing class materials.

**Use of the Canvas**

Canvas will be used to facilitate course communication through announcements. Also, on the class Canvas site you will find:

- Lecture slides
- MBPF textbook exercises and solutions.
- Sample midterm and final exam questions & solutions.
- Excel spreadsheets for cases.
Suggested Readings

None of these readings are a requirement for the course. Nonetheless, you may find them interesting.


_Call Center Management on Fast Forward: Succeeding in Today’s Dynamic Customer Contact Environment_ by Brad Cleveland, ICMI Press, 2006.


Module I: Introduction

(April 7) Class 1: Introduction to Operations Management and Course Overview

Objective: Characterize “operations management” and its link to business strategy to gain competitive advantage. Introduce the fundamental process measures throughput, inventory and flow time, and Little’s Law.

Required Reading:
- *The Goal*: start reading
- *MBPF*: Chapter 1, 2, 3.1-3.5, 3.7
- *Pizza Pazza* (Attempt, but not hand-in questions 1 & 2 in the case.)

Assignment:
- Complete student information survey via Canvas

Module II: Process Management

(April 14) Class 2: Process Flow and Capacity Analysis

Objective: To develop a fundamental understanding of what determines the capacity of an operation, the impact it has on costs, and how to alter it for operational improvement.

Required Reading:
- *National Cranberry Cooperative*
- *The Goal*: through page 62
- *MBPF*: Chapter 5

Prepare with your group and hand-in:
- Assignment: Concept Check #1
- Case Assignment: National Cranberry Cooperative

Recommended problems (Do not hand-in): 5.1, 5.2, 5.3.

(April 21) Class 3: Process and Financial Flow Analysis

Objective: Discuss where to target improvement using process flow charts and fundamental process performance measures such as flow time, inventory and throughput. Discuss the drivers of flow time and capacity.

Required Reading:
- *Portland Computer Systems*

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1 This syllabus is subject to change.
• *The Goal:* through page 161
• *MBPF: Chapter 3.6, 4*

Prepare with your group and hand-in:
• *Assignment: Concept Check #2*
• *Case Assignment: Portland Computer Systems*

**Recommended problems (Do not hand-in):** 3.4, 3.8, 3.9.

(April 28) **Class 4: Queueing**

**Objective:** To examine how enterprises manage capacity in business processes that are subject to uncertainty in supply and demand.

**Required Reading:**
• *The Goal:* through page 246
• *MBPF: Chapter 8*
• “*The Psychology of Waiting Lines,*” Maister.
• “*Wait Times,*” Fassler.

Prepare with your group and hand-in:
• *Case Assignment: The BAT case (Pre-assignment)*

**Recommended problems (Do not hand-in):** 8.1, 8.4a, 8.5, 8.8 (computing the fraction of claims that are completed in less than 10 days is not required)

(May 5) **Class 5: Capacity Pooling & Review**

**Objective:** Show how queuing performance varies with arrival volume and examine what this implies for system design. Review the course materials up to now and solve practice questions.

**Required Reading:**
• *To Pool or Not to Pool*

Prepare with your group and hand-in:
• *Assignment: Concept Check #3*

(May 12) **Class 6: MIDTERM & House Building Game**

• The midterm exam will be in class during our regular class session.
• This is a closed notes/closed book exam. You will be allowed to bring one page of notes, double-sided.
• You may use a calculator but you may *not* use a laptop or cell phone as a calculator.
Objective: After the midterm we will play the House Building Game through which we will explore the relationship between process structure and performance (cost, quality and time).

Module III: Lean Operations and Quality Control

(May 19) Class 7: Lean Operations and Quality Control

Objective: Building on the House Building Game, introduce the paradigm of lean operations. Study the major components of the Toyota Production System.

In a perfect world, a process would always produce exactly the same outcome. In an imperfect world, there is variation in process output. How then do we measure the capability of a process? How do we verify that a process improvement effort has been successful? How do we know whether an observed level of variability is a cause for concern?

Required Reading:
- MBPF: Chapter 9, Chapter 10: Sections 10.1 – 10.4
- Quality Wireless (A) and (B)
- “Decoding the DNA of the Toyota Production System,” Spear and Bowen.


Module IV: Supply Chain Management

(May 26) Class 8: Inventory Management

Objective: To introduce the fundamental theory and basic concepts of inventory management, Newsvendor model, Economic Order Quantity model and safety and cycle stock policies.

Required Reading:
- MBPF: Chapter 6, 7.3

Prepare with your group and hand-in:
- Assignment: Concept Check #4
- Assignment: Inventory Processes

Recommended problems (Do not hand-in): 6.2, 6.4, 6.5, 7.1, 7.2, 7.3, 7.4, 7.5.

(June 2) Class 9: Pooling: Centralization & Postponement

Objective: Discuss different pooling methods, particularly centralization and postponement, their pros and cons, and implications for supply chain design.
Reading:

- *MBPF: Chapter 7*
- *Palü Gear*

Prepare with your group and hand-in:

- *Case Assignment: Palü Gear*
- *Assignment: Concept Check #5*

Recommended problems (Do not hand-in): 6.10, 7.8, 7.9.

(June 9) Class 10: Littlefield Technologies Debrief and Wrap-up

Objective: Summarize the lessons learned from the Littlefield Technologies game, and draw together the various learning in the course.

Prepare with your group and hand-in:

- *Littlefield Technologies post-game write-up*

(June 16) FINAL

In preparing for the final, review the sample final (available on Canvas) and MBPF examples and exercises (solutions are available on Canvas). In addition, be aware of the following:

1. The final will be an in-class exam. You will have 180 minutes (three hours) to complete it.

2. The exam will only be available during exam period.

3. The exam is cumulative.

4. The exam is open book. You may consult your textbook, class handouts (including material from the class Canvas site), and class notes. You may use the computer worksheets used in class. You may not use any other materials.

5. You may use a calculator and/or laptop computer. A laptop may only be used for a calculator, Excel, or to access downloaded class files.