## Course Outline: Spring 2015 - Sections 65 & 66 [Tentative. See Canvas for Updated Information]

**Professor Islegen**

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Instructor: Ozge Islegen
Office: Jacobs 570 (MEDS Dept)
Phone: (847) 467-3145
Email: o-islegen@kellogg.northwestern.edu

Office Hours: Wednesday - You can go to any of the following (all in MEDS dept.; 5th floor). Please make an effort to go to your own instructor.

Prof. Allon: 9:00 – 10:30  (RM 543)
Prof. Bassamboo 10:30 – 12:00 (RM 565)
Prof. Islegen: 13:00 - 14:30  (RM 570)
Prof. Moreno 14:30 – 16:00 (RM 556)

Course Description and Objectives

This course provides a general introduction to operations management. Operations management is the management 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 for products and services, finance provides the capital, and operations produces the product. 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 management, supply chain management, and quality management. We will also discuss developments such as lean operations, just-in-time operations, and time-based competition.

**Required Texts**

Required materials available at the bookstore:

1. Course Pack: cases (common across all instructors).

All cases listed in the class-by-class reading list below are found in the Course Pack. Readings listed as “optional” can be found in the Course Materials section of the class Canvas site.

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 on the 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 (1) class contribution, (2) individual quizzes, (3) written team assignments and (4) exams. The midterm exam will be in class, closed-book, and will be held during regular class session 10. 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.

Your course grade will be based on a weighted evaluation of the following categories:

1. Class contribution 10%
2. Case write-ups 15%
3. Individual quizzes 10%
4. Midterm examination 25%
5. Comprehensive final examination 40%

Preparing for Class

Course assignments are designed to engage you in the issues, to teach you ways to think about and analyze operational problems, and to prepare you to be effective managers. The enclosed course outline and detailed schedule provides you, class by class, with a brief description of the class, the readings and case preparation questions (if any).

As part of your class preparation, please consider how you would answer each of the discussion questions. The readings and assignments should require an average of about three to four hours of preparation per class meeting. If you find yourself averaging more preparation time per session, please let me know. (Typically, students find the class load high in the first three weeks. As you become more comfortable with the material, this subjective assessment will change for the better.)

Case Write-Ups

Each case write-up should address the question in italics that goes with the case assignment. In preparing your write-up, please adhere to the following guidelines:

⇒ Be concise and well-structured: Recommendations should be summarized on the first page and be complemented by a crystal clear discussion of how these follow from your analysis.
Your write up should not exceed 2 pages of text (11pt, 1 ½ lines spaced), not including exhibits. (Remember: 2 pages is a limit, not a quota.)

Be to the point: Know that you write to someone who knows the facts of the case; focus on your explaining, and making a clear case for, your recommendations.

Be punctual: Late submissions will not be accepted.

All case write-ups are to be done in assigned groups. Group assignments will be available by the end of the first week of the term. For most cases, 3 to 4 hours of team-time (after personal prep) should be sufficient. Some cases are detailed and more open-ended. You should use your team’s judgment to figure out how to tackle those cases. 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.

The Kellogg Honor Code stipulates that you may put your name on the submission only if you contributed to the group discussion. Toward the end of the term, you will be asked to fill out an assessment of teammates’ contributions to group assignments. These assessments will play a role in determining final grades.

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.

Class Contribution

In-class contribution will consist mainly of voluntary contributions, although I may call upon students to encourage broader participation. (Although cold calling may increase anxiety, the KSA suggests that “supportive” cold calling encourages you to be better prepared for class and as a result improves the overall class discussion.)

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 in the classroom. While attendance for any given class session is not
compulsory (though encouraged), students’ compliance with the Kellogg classroom etiquette policy will be strictly enforced.

In particular, you may not:

1. Engage in any:
   a. Cross-talking,
   b. Late-coming,
   c. Leaving the class for a coffee or snack break, picking up mail, etc.,
   d. Use of a cell or smart phone in class, or
   e. Other similar activities that have the potential of distracting other students and disrupting the progress of the class.

2. Use a computer (e.g., a laptop or a tablet) in class unless given permission.

3. 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.

**Use of the Web**

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.
- Software downloads for cases.
- Additional readings obtained through the Northwestern Library with permissions for Kellogg students and faculty.
- You are also encouraged to check out Kellogg’s operations management blog, *The Operations Room:* [http://operationsroom.wordpress.com/](http://operationsroom.wordpress.com/)
Suggested Readings

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


Course contents

This is a list of the modules and classes of the course. The list is tentative and subject to adjustments. For up-to-date information and for details on preparation tasks, reading assignments, written assignments, please see Canvas.

Module 1: Operations Strategy

Class 1: Introduction to Operations

Objective: Characterize “operations management” and its link to business strategy to gain competitive advantage.

Class 2: Aligning Strategy and Operations: Focus

Objective: Illustrate to the importance of aligning strategy and operations. Discuss the notion of focused operations, its advantages and challenges.

Class 3: Product-Process Matrix

Objective: Discuss process types, their characteristics and the product-process matrix (this wraps up Module 1).

Module 2: Process Analysis and Applications

Class 3 (2nd half): Process Measures and Little’s Law

Objective: Introduce the fundamental process measures throughput, inventory and flow time, and Little’s Law, the key relationship among the three.

Class 4: Process Flow Analysis. Targeting Improvement

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

Class 5: Flow Time & Capacity Analysis

Objective: Discuss the drivers of flow time and capacity.

Class 6: Flow Time & Capacity Analysis: Peak Loads

Objective: Reinforce and extend the concepts discussed in Classes 3-5 to settings with temporary excess demand and show how to apply them to guide capacity investment decisions.
Module 3: Lean Operations

Class 7: House Building Game

Objective: Explore the relationship between process structure and performance (cost, quality and time) through a team-based simulation game.

Class 8: Paradigm of Lean Operations

Objective: Introduce, drawing on your house game experience, the paradigm of lean operations with its focus on attaining an ideal process through waste reduction.

Class 9: Variability and Quality at the Source

Objective: Study the major components of the Toyota Production System and critically assess the costs and benefits.

Module 4: Quality Management

Class 11: Quality and Voice of the Customer

Objective: Discuss the different connotations of “quality”. The first step in strategic quality management is to map “the voice of the customer” into design and operational specifications. The second step in strategic quality management is to determine the current process capability and plans for improvement. Once the plans are implemented, a manager needs to “check” that improvement has actually taken place. Finally, a manager needs mechanisms to verify that the process continues to provide improved performance. In this context we introduce statistical process control.

Module 5: Capacity Management in Services

Class 13: Capacity, Queuing & Flow Time Analysis

Objective: Introduce queuing phenomena and discuss managerial actions that mitigate queuing’s negative impact on operational performance.
Class 14: Design of service systems (Economies of Scale and Priorities)

Objective: Show how queuing theory can be used as a tool for managing service operations facing time-sensitive customers.

Class 15: Design of service systems: flexibility and pooling

Objective: Show how queuing theory can be used as a tool for managing service operations facing time-sensitive customers.

Module 6: Supply Chain Management

Class 16: Optimal Service Level.

Objective: Discuss the “newsvendor” model, an important methodology for determining the optimal order quantity and level of product availability, in the context of short-life cycle products, e.g., fashion goods, whose value quickly decay over time.

Class 17: Economies of Scale & Cycle Inventory

Objective: Discuss how to manage cycle inventories to exploit economies of scale.

Class 18: Uncertainty, Safety Inventory & Pooling

Objective: Discuss forecasting characteristics and how to manage safety inventory to protect against uncertainty in demand and/or supply lead times. Discuss the concept of inventory “pooling” and its role in supply chain design.

Class 19: Pooling: Centralization & Postponement

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

Class 20: Wrap Up and Review
Operations 430

**Midterm Exam**

In preparing for the midterm, we suggest that you review the sample midterm (available on Canvas) and *MBPF* examples and exercises (solutions are available on Canvas).

The midterm exam is, of course, an individual assignment. Be aware of the following:

1. The midterm exam will be in-class during our regular class session.
2. This is a closed-notes/closed-book exam.
3. You may use a calculator but you may *not* use a laptop or cell phone as a calculator.

**Final Exam**

The date and time of the final will be announced as soon as we have the information from student affairs.

In preparing for the final, we suggest that you review the sample final (available on Canvas) and *MBPF* examples and exercises (solutions are available on Canvas).

Be aware of the following:

1. The final will be an in class exam and you will have 180 minutes (three hours) to complete it.
2. The exam is cumulative.
3. 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.
4. You may use a calculator and/or laptop computer. A laptop may only be used for a calculator, Excel, or to access class files.