

Illinois Institute of Technology
Stuart School of Business
Course Syllabus
Spring 2012

Instructor Information

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Teaching Assistant: Liam Barrett will be the teaching assistant for the course. You may contact Liam at lbarrett@hawk.iit.edu.

Course Information

Course #: BUS 305
Course name: Operations Management

Course description: This course introduces you to concepts and techniques related to the design, planning, control and improvement of service and manufacturing operations. The course attempts to make you conversant in the language of operations management, provide you with quantitative and qualitative tools to analyze basic operations issues, and allow you to see the role of operations management in the overall strategy of the firm. We will cover topics in process analysis, project, inventory and supply chain management and operations strategy. In each module of the course, we will introduce basic tools for analyzing operations problems, methods of managing that aspect of operations, as well as a strategic view, typically using cases. Through this approach we hope to have you learn about operations management tools and about the context in which they operate.

Course Objectives: The course objectives are to:

1. Understand the trade-offs that exist between strategies and why strategic priorities are important.
2. Understand the role variability (in customer arrivals, service durations, and server availability) plays in determining cycle times and system performance.
3. Diagnose an operations-oriented business situation, identify its challenges and opportunities, and design an appropriate plan of action.

To pursue these objectives most effectively, we will require you to prepare cases and discuss them in class, read textbook chapters and complete problem sets, and participate in simulations and exercises. Our objective is to create as much hands-on interaction

with operations issues as possible, allowing you to examine how they impact the overall performance of an organization.

Course Day and Time: Monday and Wednesday, 11:25-12:40pm

Pre-requisites: None.

Required Course Materials

Text: No required text.

Materials: Harvard Business School Cases and Simulation

Software: Littlefield Technology Software

Hardware: ResponseCard RF LCD Clickers byTurning Technologies

Optional Reference Text: *Operations and Supply Chain Management*, Thirteenth Edition, by Jacobs and Chase, 2011.

Course & Instructor Policies

Late work: No Late work will be accepted.

Class attendance: You are expected to attend all class meetings.

A maximum of *five* absences is allowed for each student (but *you must attend the exams and the Experiential Supply Chain Exercise*). My policy regarding absences is *not* to ask for any explanation when you miss a class.

Students with more than five absences will receive a D in the course. As a result, you should take into account possible “emergencies,” job interviews (etc.), which may require you to miss classes during the semester.

Participation: I have made a sincere effort to keep the amount of reading in each class reasonable; in turn, I expect you to read the required materials and be well-prepared for each class. Cases, in particular, require a detailed reading and will often require analysis of relevant data to support your conclusions.

Since class participation is part of your course grade, it is important that you strive to be a vital contributor to such discussions. In an effort to encourage class participation, I will occasionally call on people and solicit contribution. The quality of your participation in discussions will be judged based on the content and depth of your comments, their relevance to the discussion, and your ability to move the class discussion forward.

If something does not seem clear to you, it is probably not clear to lots of others, so please speak up.

Laptop and Electronic Device Policy[†]: A mutually supportive learning environment depends on active attention and engagement. For this reason, no use of laptops or any other electronic device (e.g., smart-phone, cell phone, iPad) is allowed during classroom sessions. The only exceptions to this policy are:

1. Each student will be asked to use a clicker (a device that allows the student to answer questions in class electronically); please bring this to each class.
2. There are **five** sessions where the use of laptops facilitates learning, and the course outline asks you to bring your laptops to these sessions only;

If you violate this policy (or, if in sessions where laptops are authorized, the instructor even suspects that you are using a laptop for purposes unrelated to the class session), you face, at a minimum, a substantial penalization in the class participation portion of your grade. (A student might ask, “Can’t an exception be made for me, so I can use my laptop to access the case or my case analysis that I didn’t print out, take notes electronically, etc.?” Although in principle laptops could be used for legitimate purposes in class, once laptops are permitted, *all* uses are permitted (the instructor cannot possibly monitor how each laptop is used), and then the classroom learning environment is so undermined that any potential gains in individual learning/convenience are far outweighed by the aggregate loss to the classroom as a whole. For this reason, the no-laptop policy is firm; it is not open to negotiation.)

Email and Modes of Communication: Email is an efficient means of communication to inform the instructor of a link to a video or article that you think may be of interest to the class, or to ask an administrative question that is not addressed in the syllabus (most administrative issues are addressed in the syllabus, so please check before emailing).

As a mode of communication, email tends to be an inefficient way to resolve subtle questions about concepts or problems (or grading). I am, therefore, happy to address any questions you may have of this type in person, or by phone, as this is much more efficient than the route of typing out lengthy emails and going back and forth.

[†] Some of the policies and lesson plans are drawn from Terry Taylor’s Core Operations Management course at the Haas School of Business.

Discipline: I take academic honesty violations extremely seriously, and will seek full academic sanctions for cheating and plagiarism violations.

Cheating: All assignments must include the following statement on its cover page: “I (we) have complied with the university honor code in completion of this assignment, and I (we) attest that this work is mine (ours) and (ours) alone.” It must be signed by all contributors.

Plagiarism: If you use any outside sources (internet, other textbooks, etc) to aid you in the completion of any assignment, you must acknowledge the original source. **Failure to do so will be considered cheating.**

Grading System/Policy

Course grades are determined from performance on homework sets, case assignments, in-class participation, simulation reports, an in-class mid-term, and a final exam. A somewhat complicated system will be used to determine the final grade. Half of each student's midterm may replace the final exam grade if that is better. Since the final exam will be comprehensive, so long as students learn the material by the final then some of the points lost on the midterms can be made up.

<i>Component</i>	<i>Weight (%)</i>	<i>Notation for % score</i>
Class attendance and participation	15	p
Case reports	10	c
Simulations: Littlefield and Beer Game	5	s
Problem Sets/Homework	15	h
Midterm exam	15 or 25	mt
Final exam	30 or 40	f

The final grade will be calculated as follows:

$$0.15*p + 0.10*c + 0.05*s + 0.15*h + 0.15*(mt) + 0.10*\text{maximum}(mt,f) + 0.30*f$$

If you get 90% or above you will get an A, 80% or above will be at least a B, and 70% and above will be at least a C. Actual grade cutoffs may be lower.

Reports should be written in the form of a memo to a senior manager in the company that is the subject of the case. In preparing this assignment, please adhere to the following guidelines:

1. Work in groups of four students or fewer. Groups **must** be formed by the third class session.
2. Hand in a paper copy of the case write-up for each group (plus an email attachment of your paper to the professor).
3. Written assignments are to be turned in at the beginning of on the day they are due.
4. Each student should have a personal copy of his/her team write-up for the corresponding class discussion.
5. Written assignments must be less than 1000 words in length, accompanied by up to 4 supporting exhibits. This is a firm constraint.
6. Exhibits should contain specific types of analysis, such as financial analysis, break-even charts, cost analysis, process-flow analysis, etc. Exhibits should contain any relevant supporting information that is too detailed for the body of the paper. Exhibits should not be simply an extension of the text.

Case Reports: A portion of each group member's grade will be determined by peer evaluations submitted by your peers.

Your group will need to submit a written report on the following cases:

1. "National Cranberry Cooperative,"
2. "Baria Planning Systems,"
3. "Barilla SpA," and
4. "Hewlett-Packard – Supplying the DeskJet Printer in Europe".

Littlefield Technologies Reports: Your team should turn in one *two-page* summary of what actions you took during the week you had access to the factory, why you took those actions, and in retrospect whether you think you did the right thing. Your team should also show, in an appendix, the analysis used to justify your actions/conclusions. Your team's grade will be partially based on your performance, but mainly based on your summary.

Some issues you may want to address in your summary:

1. Description of the strategy that was followed, with a detailed explanation of its underlying rationale; You may submit your any spreadsheet analysis used to support your decisions.
2. Assessment of its performance;
3. A posteriori suggestions for improving your performance in this simulation;
4. Description of the most important lessons you learned or insights you gained.

Midterm Exam: The midterm will be held in class on Wednesday, March 12. The final exam will be held during the exam period. Date to be announced.

For the midterm you are **allowed** to bring in one piece of 8½*11 paper with anything you like written on it (front and back). For the final you are allowed two such pieces of paper. Note that the majority of weight for solutions to problems will be given to the correct approach, not to correct numerical results. Show all work! Students with valid medical or personal excuses (e.g., hospitalization or death of a near relative) for not taking an exam must contact the professor *before* the exam.

Make-up examinations will be scheduled several weeks subsequent to the scheduled examination when all students who are eligible to make up the examination can take it together at one time. Note that **taking a make-up exam is not a choice** and it will be considered only when you show that you were unable to take the examination due to a catastrophic event (e.g., hospitalization). **Make-up exam for the final will be scheduled for the end of August.**

Problem sets: Problem sets may be done in groups of up to 2 people. Please hand in one write-up per group. Because answers will be discussed in class, no late homework will be accepted.

It is a violation of the honor code to consult homework solutions from previous years or to work in groups larger than those specified.

All assignments, other than problem sets, must be typed.

Disabilities

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are listed on the first page of the syllabus. The Center for Disability Resources is located in the Life Sciences Building, room 218, 312-567-5744 or disabilities@iit.edu

Copyright/Plagiarism/Academic Integrity

Rules on Plagiarism and Academic Integrity

Plagiarism and other violations of academic integrity are strictly prohibited and subject to penalty as defined by the University. Information about the IIT academic requirements for graduate students can be found at:

[http://www.iit.edu/graduate_admission/admitted_students/orientation/pdfs/Graduate Student Handbook.pdf](http://www.iit.edu/graduate_admission/admitted_students/orientation/pdfs/Graduate_Student_Handbook.pdf)

The academic integrity material in the handbook is found at page 31 in the IIT student handbook. Other parts of the handbook also contain material and rules that apply to graduate students. Students will be expected to conform to the rules and procedures set forth in the handbook.

The code of conduct governing writing by students at IIT requires original writing, prohibits plagiarism and provides severe sanctions for plagiarism. Original writing consists of thinking through ideas and expressing them in your own way. If the ideas are from other sources, use footnotes or other citation methods to indicate the source of the ideas. Plagiarism is the act of passing off someone else's work or ideas as your own. The sanctions include, but are not limited to, expulsion and the imposition of a punitive grade of 'E'.

What is Plagiarism?

Often there is some confusion as to what constitutes plagiarism. Plagiarism is the act of passing off someone else's work as your own. To assist in providing an understanding of the types of writing that constitute plagiarism, three types of are each discussed below. Also discussed below is the problem of "string citations." String citations are not plagiarism, but many professors will reject string citations because they are not the student's original work.

Word for Word copying: The use of any phrase or excerpt from another source requires the use of quotation marks around the copied material, or if the material is more than a few lines, the copied material should be placed in its own indented paragraph. A citation in proper form is always required to identify the source.

Plagiarizing by Paraphrase: When a writer uses a source, substitutes words and sentences, or even changes the order but keeps the meaning of the original, a citation is required. In the example given below, the original is on the left. The paraphrase in the right box constitutes plagiarism.

<p><u>Original:</u> It is not generally recognized that at the same time when women are making their way into every corner of our work-world, only one percent of the professional engineers in the nation are female. A generation ago, this statistic would have raised no eyebrows, but today, it is hard to believe.</p>	<p><u>Paraphrase:</u> Few people realize now that women are finding jobs in all fields, that a tiny percentage of the country's engineers are female. Years ago this would have surprised no one, but now it seems incredible.</p>
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The writer could avoid plagiarism here by acknowledging the source and providing a proper citation.

Mosaic Plagiarism: Here the writer lifts phrases and terms from the source and embeds them in his own prose. An example follows in which the lifted phrases are underlined:

The pressure is on to get more women into engineering. The engineering schools and major corporations have opened wide their gates and are recruiting women zealously. Practically all women engineering graduates can find attractive jobs. Nevertheless, at the moment, only one percent of the professional engineers in the country are female.

Mosaic plagiarism is sometimes caused by careless note taking. However, it looks dishonest and is judged as such. The use of quotation marks around the original wording and citation avoid the problem of plagiarism. Often a better approach is to use paraphrase or to quote directly (with appropriate citations).

Plagiarism can be avoided by providing citations for the sources of any material, including *ideas, phrases, or sentences* that you have used in your paper. A number of different systems are available for providing citations. The key to all of them is that the writer must clearly identify for the reader the sources of all material (including ideas) that have come from somewhere else.

String Quotation Problem: Sometimes a student will write a paper consisting of a string of quotations. It is usually much better for a student to provide his or her own analysis and write the paper in his or her own words. Many professors will reject a paper consisting primarily of material quoted from other sources because they do not view such a paper as the student's own work. You should understand your professor's view with respect to string quotations prior to writing your paper.

OPERATIONS MANAGEMENT

BUS 305 – SPRING 2012

COURSE STRUCTURE AND SCHEDULE

Session	Date	Topics	Assignment Due	Optional Reading
1.	1/09	Course Overview – Introduction to Field		Chapter 1
2.	1/11	Operations Strategy & Competitiveness: Operations Priorities		Chapter 2
3.	1/16	--- No Class --- MLK Day		
4. – 5.	1/18 – 1/23	Advanced Excel Functionality I: Built-in Excel Functionality	Bring Laptop	
6.	1/25	Advanced Excel Functionality II: What-if Analysis	Bring Laptop	
7.	1/30	Advanced Excel Functionality III: Pivot Tables	Bring Laptop	
8.	2/01	Process Analysis Fundamentals: Utilization and Process Flow Analysis	Problem Set #1	Chapter 5
9.	2/06	Service Process Selection		Chapter 6
10.	2/08	Process Analysis: Capacity Management	Prepare <i>National Cranberry</i> , including write-up	
11.	2/13	Waiting Line Management I: Waiting Line Characteristics		Teaching Note 7
12.	2/15	Waiting Line Management II: Parallel Servers		
13.	2/20	Waiting Line Management III: Variability Propagation	Problem Set #2	
14.	2/22	Service Management: Queueing Psychology	Prepare <i>Baria Planning Case</i> , including write-up	
15.	2/27	Economic Order Quantity		Chapter 17
16.	2/29	Economic Production Quantity		
17.	3/05	Supply Chain Simulation Class from 11:25 – 1:30pm	Read <i>Preparing for the Experiential Supply Chain Exercise</i> Problem Set #3	
18.	3/07	Supply Chain Simulation Debrief	Prepare <i>Barilla Case</i> , including write-up	
19.	3/12	Midterm Exam		
20.	3/14	Exam Return		

Session	Date	Topics	Assignment Due	Optional Reading
Optional Class	3/16	Review of Statistics		
21.	3/26	Newsvendor Model		Chapter 17
22.	3/28	Supply Chain Collaboration: Revenue Sharing Contracts		
23.	4/02	Multi-period Inventory Planning: Continuous Review Model	Read <i>Littlefield Technologies</i>	
	4/02	Littlefield Technologies Starts 12:40 P.M.		
24.	4/04	Optional Class: Littlefield Simulation Consultations		
25.	4/09	Littlefield Debrief	<i>Littlefield Write-up Due</i>	
26.	4/11	Multi-period Inventory Planning: Periodic Review Model		
27.	4/16	Materials Requirement Planning	Problem Set #4	Chapter 18
28.	4/18	Project Management: Critical Path Method	Submit <i>Hewlett-Packard Case Write-up</i>	Chapter 10
29.	4/23	Project Management: Project Evaluation and Review Technique		
30.	4/25	Course Wrap-up	Problem Set #5	

DETAILED SESSION PLANS

PART I - OPERATIONS FUNDAMENTALS & EXCEL FUNCTIONALITY

- 1) *Mon., Jan. 09* *Manufacturing & Service Operations Management – The Basics*
✓ Topics
Course overview
Introduction to the field
- ☰ Reading(s):
• Chapter 1
- 2) *Wed., Jan. 11* *Operations Strategy and Competitiveness*
✓ Topics
Operations Strategy
Operations Priorities
- ☰ Reading(s):
• Chapter 2
- 3) *Mon., Jan. 16* *NO CLASS -- Martin Luther King Day*
- 4-5) *Wed., Jan. 18* *Advanced Excel Functionality I*
✓ Topics
Using Names in Functions
Using Text Functions to Manipulate Data
Logical and LOOKUP Functions
- Assignment(s):
• **Bring Laptop!**
• **Group List** – Selected group name and name of group members.
- 6) *Wed., Jan. 25* *Advanced Excel Functionality II*
✓ Topics
“What-if” Analysis: Goal Seek, Data Tables, and Scenario Manager
- Assignment(s):
• **Bring Laptop!**
- 7) *Mon., Jan. 30* *Advanced Excel Functionality III*
✓ Topics
Pivot Tables
- Assignment(s):
• **Bring Laptop!**

PART II – PROCESS ANALYSIS AND QUEUING SYSTEMS

8) Wed., Feb. 1 *Process Analysis Fundamentals I*

- ✓ Topics
Utilization
Processes and the Process Flow Diagram

- ☰ Reading(s):
 - Chapter 5

- Assignment(s):
 - Problem Set #1

9) Mon., Feb. 6 *Service Process Selection*

- ✓ Topics
The Process View
Process Positioning
Strategic Fit

- ☰ Reading(s):
 - Chapter 6

10) Wed., Feb. 8 *Process Analysis: Capacity Analysis*

- ☑ Case Discussion:

“National Cranberry Cooperative (Abridged),” *Harvard Business School No. 9-688-122*, 1997.

Describes the continuous flow process used to process cranberries into juice and/or sauce. Requires student to analyze process flows to determine where the bottlenecks are and to decide how and whether, to expand capacity.

- Assignment(s): *Due at start of class.*
 - Prepare case questions.

11) Wed., Feb. 13 *Waiting Line Management I*

- ✓ Topics
Waiting line characteristics
Quantitative analysis of waiting lines

- ☰ Reading(s):
 - Teaching Note 7

- ☑ Queuing at Disney

12) Wed., Feb. 15 *Waiting Line Management (Part II)*

- ✓ Topics
Parallel Serves
Examples

- Queuing at National Association of Realtors and Apropos Technology

13) Mon., Feb. 20 ***Waiting Line Management Theory (Part III)***

✓ Topics
Variability Propagation

- Assignment(s):
 - Problem Set #2

14) Wed., Feb. 23 ***Service Management: Baria Planning Solutions***

✓ Topics
Baria Case Discussion

☞ Case Discussion

“Baria Planning Solutions, Inc.: Fixing the Sales Process,” *Harvard Business School No. 4568-PDF-ENG, 2011*

Baria Planning Solutions (BPS) is a consulting firm that specializes in using spend analysis to help companies identify savings through reduced procurement costs and improved supplier performance. Management is concerned about the disappointing performance of the sales team in attaining new clients and renewing existing ones. The Sales directors feel they do not get the help they need from Sales Support to close new deals, while the Sales Support directors believe they could provide better support by organizing into industry-specific divisions. The consulting industry is becoming increasingly competitive and inefficiencies in the sales process at BPS may interfere with the company's ability to win new business. The recently hired director of North American Sales Support must analyze the current process flow for Sales Support and identify the problems facing the sales organization. The president of the company has asked her to present a proposal for improving the performance of the entire group.

- Assignment(s): Due at start
 - Prepare case questions.

PART III – INVENTORY & SUPPLY CHAIN MANAGEMENT

15) Mon., Feb. 27 ***Inventory Planning – Deterministic, Multi-period Model***

✓ Topics
Assumptions
The Economic Order Quantity (EOQ) model

16) Wed., Feb.29 ***The EOQ model (cont.)***

✓ Topics
Extensions to the EOQ model

17) Mon., Mar. 5 ***Experiential Supply Chain Exercise***

We will play the Beer Game at a computer lab (*location to be determined*). DO ***NOT*** TALK WITH YOUR CLASSMATES, OR WITH STUDENTS FROM PREVIOUS YEARS, ABOUT THE GAME!! We'll spend part of our class time debriefing your experiences and talking about the critical aspects of supply chain management.

Each student must a bring a Laptop!

- Assignment(s): Due at start
 - Prepare case questions.

18) *Wed., Mar. 7*



Supply Chain Collaboration

Case Discussion

“Barilla SpA.,” *Harvard Business School No. 9- 694-046*, 1994.

Barilla SpA, an Italian manufacturer that sells to its retailers largely through third-party distributors, experienced widely fluctuating demand patterns from its distributors during the late 1980s. This case describes a proposal to address the problem by implementing a continuous replenishment program, under which the responsibility for determining shipment quantities to the distributors would shift from the distributors to Barilla. Describes support and resistance within Barilla's different functional areas and within the distributors Barilla approached with the proposal.

- Assignment(s):
 - Submit your group case report at the beginning of this class

19) *Mon., Mar. 12*

Exam I

- The first exam will be held in class. The exam will cover up to and including EOQ and its extensions.

20) *Wed., Mar. 14*

Exam Return

Optional Class: Friday March 16: Review of Statistics

⊖ *Mar. 19-23*

NO CLASS -- Spring Break.

21) *Mon., Mar. 26*



Inventory Planning and Uncertainty – Single Period Model

Topics

Purpose of inventory
Costs of inventory
The Newsvendor Model



Reading(s):

- Chapter 17



Inventory Management at Caterpillar and Navistar International

22) *Wed., Mar. 28*



Supply Chain Collaboration – Revenue Sharing and Other Contracts

Topics

Designing the supply chain contracts
Inventory management
Incentives

23) *Mon., Apr. 2*

Multi-Period Inventory Planning I



Topics

Continuous review systems and (r,Q)-policy

Service Measures

Role of Safety Stock



Assignment(s):

- Read Littlefield Technologies Overview Handout

Mon., Apr. 2

Start of Littlefield Technologies

The Littlefield Simulation is an internet-accessed simulation that runs continuously, starting at the lunch period right after class. Because of the individualized nature of the simulation (competition among the student teams), we will not meet together as a collective class to discuss the simulation and strategies for playing it. Instead, your team can sign up for a meeting with me to discuss your team's analysis and strategy.

The instructor will be available during the next class session to meet with students.

24) *Wed., Apr. 4*

Littlefield Simulation Consultations

Meeting with the instructor is *strictly optional*. If you do plan to meet with the instructor, you should be prepared to present the analysis you have completed to inform your decisions; further, your entire team should attend. If you meet with the instructor, the instructor will be happy to discuss: the concepts in the course; the decisions in the game; and which concepts are relevant to which decisions in the game and why. The instructor will also be happy to address specific questions (e.g., here is an analysis we did, but we had a question about what we did in this portion of the analysis). The instructor will not be providing answers to questions of the type "Here's what we thought about doing. Is this the right thing to do?" These kinds of questions will be addressed in the debrief session.

All group members must be present.

25) *Mon., Apr. 9*

Littlefield Technologies I Debrief



Littlefield Debrief:

Be prepared to discuss your strategy with the class.



Assignment(s):

- Littlefield write-up due at start of class.

26) *Wed., Apr. 11*

Multi-Period Inventory Planning II



Topics

Periodic review order-up-to policies

PART III – PLANNING AND CONTROLLING THE SUPPLY CHAIN

- 27) *Mon., Apr. 16* ***Manufacturing Production Systems***
- ✓ Topics
Push and Pull systems defined
Capacity requirements
Material Requirement Planning (MRP)
 - ☰ Reading(s):
 - Skim Chapters 12 and 18
 - Assignment(s):
 - Problem Set #4
- 28) *Wed., Apr. 18* ***Project Management***
- ✓ Topics
Managing change to meet objectives
Project Management Models- Critical Path Method
 - ☰ Reading(s):
 - Chapter 10
 - ✳ Project Management: Building the Alton “Super Bridge”
- 29) *Mon., Apr. 23* ***Project Management (cont.)***
- ✓ Topics
Managing Uncertainty
Project Management Models – PERT
- 30) *Wed., Apr. 25* ***Course Wrap-up***

Final Exam date to be announced.

This outline is subject to change.