

UNIVERSITY OF SOUTHERN CALIFORNIA
Marshall School of Business

BUAD 315x – Basics of Project and Operations Management for non-majors¹
Fall 2013

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Course Description

How do organizations, for-profit and non-profit alike, meet their needs and stay consistent with their goals and values? How do organizations make trade-off decisions in the face of uncertainty? Project and Operations Management provides tools and methods to optimally answer these questions in a global business world.

This course is about “How to get things done better and more efficiently.” Given the goal (to deliver books, develop a drug, finish the film’s post-production process on time, stock appropriate set of toys just in time for the holiday season, etc.), we will learn a set of tools and frameworks for making sound decisions about the operation of the organization.

Operations Management is primarily concerned with the design, production, and delivery of goods and services. Operations managers are responsible for the systematic planning, designing, controlling and improving the various processes involved from the time the product or service is designed till customer delivery occurs. The challenge for operations managers is to produce goods and services and deliver them in an efficient manner and in accordance with the business strategy of their company. Typically, this involves balancing the needs for satisfying customer demand, on-time delivery, lower costs, and higher quality.

Additionally, more and more business activities are now project-based. Managing projects is increasingly becoming critical for many organizations. Project Management is concerned with planning, monitoring, and controlling every aspect of the project. Project managers have conflicting goals – time, budget, and product/service features. It is the project manager’s responsibility to balance these conflicting goals and complete the project successfully. We will learn how we can make decisions effectively in complex projects with uncertainties, what major risks are in projects, and how to manage them using a set of tools.

In this course we will learn the fundamentals of Project and Operations Management, enhance your managerial insight and intuition, and improve your decisions. More specifically, we will investigate the following aspects of Project and Operations Management to practice decision-making skills:

- Project Management
- Optimal Resource Planning and Allocation
- Managing Uncertainty
- Managing Product/Service Variety.
- Managing Global Supply Chains

This will be accomplished through: (i) understanding of the business environment and the structure of important problems; (ii) analysis of the relevant principles, issues, and trade-offs; and (iii) working knowledge of relevant methodological tools, solution procedures, and guidelines.

¹ August 28, 2013. Updated version may be available in Blackboard.

Prerequisites

Students are expected to have access to and be able to use regularly a word processor, e-mail, a web browser and a spreadsheet software package.

Textbook

- Custom-made textbook. This is an eBook available electronically at www.mcgrawhillcreate.com/shop eBook purchase instructions will be posted in Blackboard.
- Other required readings are available via USC Libraries' Automated Reserve System (ARES)².

Instructional Methods

The classes will consist of lectures, discussions, group exercises, and simulation games.

[Assigned Readings and Homework Assignments]

Students must complete the assigned readings and homework assignments prior to coming to class.

Homework assignments are accepted only via Blackboard. The instructor will not accept homework assignments in class.

[Group Exercises]

In some sessions, we will have group exercises. Groups are randomly assigned.

[Root Beer Game]

To understand the significance of major issues in supply chains, we play the Root Beer Game. Every student must purchase a license from Harvard University and register by Midterm exam. Details will be posted in Blackboard.

² <https://usc.ares.atlas-sys.com>

Grading

The course grade, which will be curved, is based on a midterm, a cumulative final exam, homework, presentation, and class participation according to the following weights:

Class Participation	10%
Homework	40%
Midterm Exam	20%
Final Exam	30%

There will be no other assignments.

All exams are closed books. You are allowed to use one double-sided crib sheet (8.5x11) on each exam. **No make-up exams are offered.**

Class Participation

It is very important for each student to actively participate in the class discussion. Read the assigned material before the class and make sure you are familiar with the main issues to be discussed in class. You will be cold-called. Your participation is evaluated mainly on the quality of your contribution and insights. I will make every effort to call on as many students who wish to speak up as possible.

Notice on Academic Integrity

The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tensions accompanying examinations. Where a clear violation has occurred, however, the instructor may disqualify the student's work as unacceptable and assign a failing mark on the paper. There may be additional penalties, including failing the course, in accordance to the university policies, as listed in the SCampus.

Turnitin Technologies

USC is committed to the general principles of academic honesty that include and incorporate the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. By taking this course, students are expected to understand and abide by these principles. All submitted work for this course may be subject to an originality review as performed by Turnitin technologies (<http://www.turnitin.com>) to find textual similarities with other Internet content or previously submitted student work. Students of this course retain the copyright of their own original work, and Turnitin is not permitted to use student-submitted work for any other purpose than (a) performing an originality review of the work, and (b) including that work in the database against which it checks other student-submitted work.

For Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your instructor as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Disclaimer

This syllabus is an invitation to students to engage in an exciting and interactive study of Project and Operations management. The intention of the instructor is to provide you with information, offer practice with skill sets, and enhance your capacity to use fundamental concepts to build your repertoire of operating strategies and make sound decisions. The learning environment will be collaborative and supportive; we will learn from one another both in and out of the classroom. To that end, modifications to this syllabus might be warranted as determined by the instructor as we assess the learning needs of this particular class of students.

COURSE OUTLINE (tentative)

Module 1: Project Management

Session 1 – August 27

Introduction to the course

The purpose of this lesson is to introduce Project Management and Operations Management to you. You and your classmates will discover that PM/OM is everywhere and that a study in PM/OM prepares you to make sound business decisions by assessing trade-offs and identifying improvements.

- Define and recognize Project and Operations Management in real-world situations
- Challenges in matching supply and demand
 - Variability, uncertainty, scale economies, incentives and information challenges
- Optimization tools and frameworks used in operations management

Required Reading:

“Stopping Crime Before It Starts” Los Angeles Times, August 21, 2010 [ARES]³
“Changing Ahead to Push Electric Cars” Los Angeles Times, December 27, 2008 [ARES]
“Clarity is Missing Link in Supply Chain” Wall Street Journal, May 18, 2009 [ARES]

Session 2 – August 29

Project Management: Overview

A project is a series of related tasks directed toward a major output. A project manager is responsible for planning, directing, and controlling resources to match the requirements of the project. You will learn the role of a project manager, and how to draw a diagram to represent a project so that we can analyze it.

- Work Breakdown Structure
- Gantt chart
- CPM diagram
- Understand the Critical Path

Required Reading:

Project Management: Chapter 5 from *Operations and Supply Management: The Core*, 3rd Ed., F. Robert Jacobs, Richard Chase, McGraw-Hill/Irwin
“Latest Delay of Boeing 787 Pushes Back First Delivery to Third Quarter of 2009” Seattle Times, April 10, 2008 [ARES]

Session 3 – September 3

Introduction to Simulation

We will learn simulation techniques using Excel add-on software called Oracle Crystal Ball. Equipped with simulation technique, we will simulate typical projects and discuss why projects tend to delay.

- **Group Exercise: Project simulation by dice**
- Critical Path Method
- Crystal Ball
- Bagel baker

Required Reading:

Project Management: Chapter 5 from *Operations and Supply Management: The Core*, 3rd Ed., F. Robert Jacobs, Richard Chase, McGraw-Hill/Irwin

³ ARES articles are available at <https://usc.ares.atlas-sys.com>

Module 2: Resource Allocation

Session 4 – September 5

Introduction to Decision Trees

Some projects are contingent on some other projects. For instance, depending on the result of R&D, you may want to pursue different projects in the future. How can we optimize our decision in an uncertain world? To analyze these situations, decision trees are useful. You will learn how to construct a decision tree, and solve the optimal decision by studying a capacity investment problem. We use another Excel add-on software called Treeplan. This is also a good time to learn about Revenue Management

- Learn to draw a decision tree and distinguish the two types of the nodes
- Practice solving decision trees
- Appreciate the value of delaying decisions to collect information
- How Revenue Management works.

Required Reading:

“Saints’ Risky Decisions were Both Calculated and Crucial” New York Times, February 9, 2010[ARES]

“You Paid What for That Flight?” Wall Street Journal, August 26, 2010[ARES]

“Next Up in Fine Dining: Pay in Advance” Businessweek, March 31, 2011[ARES]

Please bring your laptop. (Or we may book a computer lab.)

Session 5 – September 10

Optimization frameworks

Optimization gives business a critical edge. In this class, you will learn that optimization is a powerful tool that can be applied to various business problems not limited to operations management. You will be able to formulate a linear program (LP) and solve small LP problem using Excel Solver.

- **Group Exercise: Study Abroad Problem**
- Recognize linear program as a special optimization tool
- Understand the components of a linear program
- Formulate linear programs and solve it using Excel solver
- Make decisions utilizing optimization to allocate resources effectively

Required Reading:

Linear Programming Using Excel Solver: Appendix A from *Operations and Supply Chain Management: The Core*, 3rd Ed., Robert Jacobs and Richard Chase, McGraw-Hill/Irwin

“Harrison Buzz Price, 1921-2010: engineer advised Disney on theme park locations” Los Angeles Times, August 17, 2010 [ARES]

“Did You Hear the One About the Salesman Who Traveled Better?” Wall Street Journal, April 23, 2004 [ARES]

“The Right Mix” Wall Street Journal, March 27, 1987[ARES]

Please bring your laptop. (Or we may book a computer lab.)

Due HW1 (Project Management)

Session 6 – September 12

Binary decision variables

We study how to model a Yes/No or Go/No Go decision in a linear program. We can now solve the Study Abroad problem using these binary decisions.

- Binary decisions
- **Group Exercise: How to pick free agents.**

Required Reading:

Linear Programming: Using Excel Solver: Appendix A from *Operations and Supply Chain Management*, 3rd Ed., Robert Jacobs and Richard Chase, McGraw-Hill/Irwin

Please bring your laptop. (Or we may book a computer lab.)

Module 3: Managing Uncertainty

Session 7 – September 17

Bagel Baker Problem

We examine the trade-offs between more and less inventories when we face demand uncertainty. We use decision tree and Crystal Ball simulation techniques to find an optimal solution.

- **Group Exercise: Bagel Baker Problem**
- Identify the trade-offs of a basic Bagel Baker problem
- Practice marginal analysis
- Crystal Ball and Optquest

Required Reading:

A Note on Newsvendor

Due HW2 (Linear Programming)

Session 8 – September 19

Midterm Exam

Module 4: Global Supply Chains

Session 9 – September 24

Root Beer Game I: Supply Chain Dynamics

The success of a company relies on its upstream supplier and downstream distribution partners. Incentive and information are two crucial factors in decision making. You will play the beer game to demonstrate the information distortion in a supply chain.

- **Game: Root Beer Game**
- Experience the bull-whip effect
- Learn how to combat the bull-whip effect.

Required Reading:

“Apple’s Supply Chain Secret” Businessweek, November 3, 2011[ARES]

“The Bullwhip Effect in the supply chain”, Lee et al, Sloan Management Review (will be posted after class)

Session 10 – September 26

Root Beer Game II: Incentives and Coordination

There are supply chain inefficiencies caused by member firms with different incentives and by asymmetric information. We will discuss how we can design supply contracts so as to achieve aligned member firms’ incentives and shared information.

- **Game: Root Beer Game**
- Double marginalization
- Asymmetric information
- Supply chain coordination

Vendor-managed inventory, Revenue sharing contract, and Buy-back contract

Required Reading:

“Former Mattel Employee’s Battle Shows Whistle-Blowers Walking a Fine Line” Los Angeles Times, February 20, 2003 [ARES]

“Can the iPad or the Kindle Save Book Publishers?” National Public Radio, April 27, 2010 [ARES]

Session 11 – October 1

OGEL Game I

We play OGEL Game twice. In this first session, we experience the challenges in seemingly easy activities. For the next two sessions, we will discuss what went right and what went wrong, and how we can improve our performances.

- **Game: OGEL Game**

Required Reading:

Session 12 – October 3

Outsourcing and Vertical Integration

As in Thomas Friedman's bestseller books, outsourcing is everywhere. We discuss pros and cons of outsourcing, and try to understand why some companies are flourishing by outsourcing while other companies are moving towards the opposite direction.

Required Reading:

“Outsourcing Innovation” BusinessWeek, March 21, 2005[ARES]

“If Speed Kills, Are You In Danger?” Information Week, March 21, 2005[ARES]

“Zara Grows as Retail Rivals Struggle” Wall Street Journal, March 26, 2009[ARES]

“The Henry Ford of Heart Surgery” Wall Street Journal, November 25, 2009[ARES]

“SeaMicro's Silicon Valley Computers” Businessweek, February 24, 2011[ARES]

“Made in USA Gives Small Business an Edge” Businessweek, March 24, 2011[ARES]

Due HW3 (Root Beer Game writeup)

Session 13 – October 8

Managing Variety and the Concept of Risk Pooling

In a hyper-competitive environment, firms have to meet customer demands as closely as possible. This often requires firms to offer a wide variety of products/services and to rapidly introduce new products/services. How can firms offer high variety and control costs? The concept of risk pooling offers some insights into how firms are able to develop creative business models that offer higher variety at lower costs.

- Postponement
- MTS vs. MTO
- Product/Service modularity
- Lead times

Required Reading:

TBA

Session 14 – October 10

OGEL Game II

After learning such concepts as risk pooling, we play OGEL Game again to see how we can apply these concepts.

- **Game: OGEL Game**

Required Reading:

Session 15 – October 15

Conclusions

Due HW4 (OGEL Game writeup)

Session 16 – October 17

Final Exam