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Time:	Tue and Thu 12:00 to 1:50pm	Room:	Fertitta Hall 414
Instructor:	Hailong Cui	Office:	Bridge Hall 401
Email:	<a href="mailto:HailongC@usc.edu">HailongC@usc.edu</a>	Office Hours:	Thu 2 to 3pm and by appointment. <i>Find extra office hours for quiz/exam below</i> <a href="https://docs.google.com/document/d/1F-hK0b7ci8_JU3QQ60tNDN5qUE6NdOHJMbGzemKrU8Q/edit?usp=sharing">https://docs.google.com/document/d/1F-hK0b7ci8_JU3QQ60tNDN5qUE6NdOHJMbGzemKrU8Q/edit?usp=sharing</a>

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TA:	Shobhit Jain	Office:	Bridge Hall 400 (conference room)
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Marshall Core Review Sessions begin January 28, 2019. See schedule here <http://bit.ly/reviewsessions>.

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### **Course Description**

How do organizations such as financial institutions, health care providers, manufacturing plants, and tech companies meet customer needs and stay consistent with their goals and values? How do organizations make trade-off decisions with respect to quality, cost, and time? Operations Management provides tools and methods to answer these questions systematically in the global business world.

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

### **Course Learning Goals**

In this course, you will learn the fundamentals of Operations Management, enhance your managerial insight and intuition, and improve your business decisions.

The focus of this course is on the Marshall Undergraduate Learning Goals (see pp. 15-16 of the syllabus for a complete description) of “understanding key business areas” and “developing critical thinking skills,” while also supporting the goal of “being effective communicators.” Upon successful completion of this course, students will be able to:

- Describe the spectrum of operations management activities in a business, and the types of decisions made by operations managers.
- Utilize a variety of tools and techniques effectively to compete successfully in the marketplace, including:
  - Business Process Management.

- Capacity Management.
- Waiting Line Management.
- Optimization.
- Revenue Management.
- Inventory and Supply Chain Management.
- Predict, anticipate, and take into account how operations management interfaces with other functional areas such as strategy, accounting, finance, human resources, and marketing.
- Demonstrate critical thinking skills to assess trade-offs in process design, capacity allocation, inventory levels, and customer service.
- Apply optimization tools and techniques to practical problems; for example, use the Excel Solver to formulate and solve a linear optimization problem.
- Apply critical thinking and problem-solving and make real-time decisions on capacity, quoted lead-times, work-in-process levels, contracts, and inventory.
- Make operational decisions taking into account the global nature of supply chains (via an experiential learning simulation), the interplay between levels of the supply chain and their locations, and its implications for pricing, competition and customer service.

### **Materials**

For most of the class, lecture notes and materials on blackboard will be sufficient. Some of the required cases, however, are published in our custom textbook. You may choose to purchase a copy, borrow a friend's, or use one of the copies on reserve below.

- *BUAD 311 Operations Management*: Custom-made textbook available in eBook format at <https://create.mheducation.com/shop/>, ISBN: 9781308430478. A limited number of hard copies are also available at the USC Bookstore, with a different ISBN: 9781308428116. There are five copies available on reserve at the Gaughan & Tiberti Library (Fertitta Hall).

You will also read and write a report on the book "The Goal", described below. Again, you may choose to purchase a copy, borrow a friend's, or use one of the copies on reserve below.

- *The Goal*, Goldratt and Cox, 3<sup>rd</sup> edition, North River Press. There are three copies available on reserve at the Accounting Library and two copies available on reserve at the Gaughan & Tiberti Library.

Finally, towards the end of the course you will play an online simulation game that will play together in class called the eBeer game. Registration for the game is mandatory and costs \$10. Instructions on registering for the game will be distributed closer to the date of play.

### **Prerequisites and/or Recommended Preparation**

Co-requisite: BUAD 310

### **Course Notes**

Please check the Blackboard site and your email daily for class preparation materials or instructions. Lecture slides will be posted on Blackboard. If you would like hard copies of them, it will be your responsibility to print them out.

## **No Recording and Copyright Notice**

It is a violation of USC's Academic Integrity Policies to share course materials with others without permission. **No student may record any lecture, class discussion or meeting with the instructor without prior express written permissions.** The word "record" or the act of recording includes, but is not limited to, any and all means by which sound or visual images can be stored, duplicated or retransmitted whether by an electro-mechanical, analog, digital, wire, electronic or other device or any other means of signal encoding. Marshall reserves all rights, including copyright, to the lectures, course syllabi and related materials, including summaries, PowerPoints, prior exams, answer keys, and all supplementary course materials available to the students enrolled in the class whether posted on Blackboard or otherwise. They may not be reproduced, distributed, copied, or disseminated in any media or in any form, including but not limited to all course note-sharing websites. Exceptions are made only for students who have made prior arrangements with DSP and the instructor.

## **ASSIGNMENTS AND GRADING DETAIL**

Participation	9%
Write-ups (3 cases)	3%
Quizzes and Exams	
• Quizzes (best 2 out of 3)	10%
• Midterm 1	23%
• Midterm 2	23%
• Final Exam	32%

The weights listed above determine a student's overall course grade for this class. The course grade represents one's performance relative to other students in the class. Your grade will not be based on a mandated target, but on your performance. Historically, the average grade for this class is around a "B." Your grade will be based on your overall score for the course, as well as your ranking among the students in your section.

## **Class Attendance & Participation**

Students are expected to attend all class sessions in their enrolled section. Your participation score is based on your contributions to the lectures including, but not limited to thoughtfully responding to the instructor's prompts; asking questions; answering other students' questions; and sharing personal or professional experiences related to course content.

BUAD 311 involves several simulation games, particularly in the second half of the course. Only the eBeer game requires a \$10 registration fee, and all the other games are free. Your performance on these simulation games will be taken into account when computing your participation grade.

## **Write ups**

There will be three case write-ups for the course, each contributing 1% to the course grade. Write-ups are short essays in response to posted discussion questions, and are graded PASS or FAIL based on completion and accuracy. **Write-ups are to be submitted on Blackboard. You should also bring a hard**

**copy of your write-up to class for discussion.** Students are responsible for familiarizing themselves with the Blackboard assignment submission interface and uploading assignments ahead of time; instructors or TAs are not responsible for individual technical difficulties related to Blackboard assignment submission.

All students are required to read *The Goal* book and participate in the class discussion. Students may get extra credit by submitting a 2-page report summarizing *The Goal* book (1%).

## **Quizzes**

There are three quizzes, of which the best two will count towards the course grade for 5% each. Quizzes are not cumulative. Quizzes are meant to help keep you “on track” with the course material. To help you prepare, approximately a week before each quiz a short set of quiz questions will be distributed. You are free to work in groups on these questions (and encouraged to do so), but **you cannot ask the TA, peer tutors or instructors for help with them.** On the day of the quiz in class, one of the questions will be randomly selected from the quiz preparation materials, with slightly different numbers and small modifications. If you have done the quiz preparation questions diligently, the quiz will be very easy for you. Solutions to the quizzes will be distributed only after all sections have taken the quiz, at which point you are free to meet with the TA, peer tutors or instructor for help with the questions. All quizzes are closed books and there are no crib-sheets permitted for quizzes. Each student should bring a stand-alone calculator capable of power and square root operations. Collaboration of any sort on quizzes is strictly prohibited and will result in an “F” in the course grade. Any suspicion of cheating will be reported and investigated by USC. Please see the “Academic Integrity and Conduct” section below for further details.

## **Midterms and Final Exam**

There are two midterm exams and one final exam, all of which are cumulative, but greater emphasis will be given to materials since the previous exam. All exams are closed books. Each student may bring one letter-sized (8.5”x11”) double-sided crib sheet for each midterm, and two such crib sheets for final. Each student should also bring a stand-alone calculator capable of power and square root operations. Students may not share the same crib sheet or calculator during a test. Collaboration of any sort on exams is strictly prohibited and will result in an “F” in the course grade. Any suspicion of cheating will be reported and investigated by USC. Please see the “Academic Integrity and Conduct” section below for further details.

**The final examination will take place on Thursday, May 2, 11:00am – 1:00pm in Fertitta Hall 414 (JFF 414). The final exam will not be given at any other time.** According to the USC Office of Academic Records and Registrar, *“No student in a course with a final examination is permitted to omit the final examination or take the final examination prior to its scheduled date, and no instructor is authorized to permit a student to do so. No student is allowed to re-take a final examination or do extra work in a course after the semester has ended for purposes of improving his or her grade.”*

**Students must attend all quizzes and exams at the indicated times and dates, in their enrolled sections.** The only exception is a “documented medical emergency,” for which the student must provide all of the following documentation by the time of the exam: (1) A signed doctor’s note, with the name and phone number of the medical professional verifying the medical emergency; (2) An email from the

student's Marshall advisor; (3) An email from a USC Support and Advocacy advisor (see "Support Systems" below). For all other reasons of missing an exam, including travels for non-emergencies, interviews, adverse traffic conditions, or forgetfulness about exam time, the student will not be allowed to reschedule, and missing an exam will result in a zero for the exam.

### **Marshall Core Review Sessions**

The Marshall Office of Undergraduate Advising & Student Affairs offers free weekly Core Review Sessions, as a supplement to classroom instruction. Marshall Peer Academic Leaders (PALs) assist students in understanding and clarifying difficult concepts covered in class that week. Students must come prepared with questions and actively participate. This is not one-on-one tutoring. The core review sessions are effective only if students regularly attend class and engage in the process of thinking critically about the course content. The sessions are a drop-in, group study format and are free to students. We have three PALs for this course: *Siddhant Begani*, *Wayne Yu*, and *Alex Borges*. Their up-to-date schedule can be found following <https://www.marshall.usc.edu/current-students/marshall-academic-resources/core-review-sessions-schedule> (full URL) or <http://bit.ly/reviewsessions> (short URL).

## **MARSHALL GUIDELINES AND USC POLICIES**

### **Add/Drop Process**

BUAD 311 will remain in open enrollment (R-clearance) for the first three weeks of the term. If there is an open seat, students will be freely able to add a class using Web Registration throughout the first three weeks of the term. If the class is full, students will need to continue checking Web Registration to see if a seat becomes available. There are no wait lists for these courses, and professors cannot add students. An instructor may drop any student who, without prior consent, does not attend the first two sessions; the instructor is not required to notify the student that s/he is being dropped. If you are absent three or more times prior to the end of week 3 (the last day to withdraw from a course without a grade of "W"), your instructor may ask you to withdraw from the class by that date. These policies maintain professionalism and ensure a system that is fair to all students.

### **Students with Disabilities**

USC is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. If you have a disability, which may impact your performance, attendance, or grades in this course and require accommodations, you must first register with the Office of Disability Services and Programs ([www.usc.edu/disability](http://www.usc.edu/disability)). DSP provides certification for students with disabilities and helps arrange the relevant accommodations.

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 the instructor as early in the semester as possible.** Any DSP students requiring extra time on quizzes/exams should introduce themselves to the instructor within the **first 3 weeks of the semester** with their DSP documentation and make special arrangements to take the tests at the DSP center. Quizzes/exams must be taken the same day as indicated on the syllabus.

**For the first quiz of the semester, students must reach out to their instructor at least 1 week prior to the quiz date for their section.** For the remaining quizzes, midterms and exams students must reach out to their instructor within the **first 3 weeks of classes**. Students who reach out after these deadlines may not be accommodated. Reasonable exceptions will be made for temporary injuries and students recently diagnosed.

DSP is located in GFS (Grace Ford Salvatori Hall) 120 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776. Email: [ability@usc.edu](mailto:ability@usc.edu).

The most common form of DSP accommodations is a 150% extended test time. For exams/quizzes, extra time will be administered by DSP, and the student is responsible for scheduling their exams electronically through DSP's online database, "MyDSP," at least one week in advance.

### **Support Systems**

#### *Student Support & Advocacy – (213) 821-4710*

Assists students and families in resolving complex issues adversely affecting their success as a student, including: personal, financial, and academic issues. <https://studentaffairs.usc.edu/ssa/>

#### *Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

#### *National Suicide Prevention Lifeline - 1-800-273-8255*

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

#### *Relationship & Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

#### *Sexual Assault Resource Center*

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

#### *Office of Equity and Diversity (OED)/Title IX compliance – (213) 740-5086*

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

#### *Bias Assessment Response and Support*

Incidents of bias, hate crimes and micro-aggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

#### *Diversity at USC – <https://diversity.usc.edu/>*

Tab for Events, Programs and Training, Task Force (including representatives for each school), Chronology, Participate, Resources for Students

## **Academic Integrity and Conduct**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include 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 (plagiarism). Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. All students are expected to understand and abide by the principles discussed in the *SCampus*, the Student Guidebook ([www.usc.edu/scampus](http://www.usc.edu/scampus) or <http://scampus.usc.edu>). A discussion of plagiarism appears in the University Student Conduct Code (section 11.00 and Appendix A).

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The review process can be found at: <https://sjacs.usc.edu/>. Failure to adhere to the academic conduct standards set forth by these guidelines and our programs will not be tolerated by the USC Marshall community and can lead to dismissal.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://dps.usc.edu/contact/report/>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report or can initiate the report on behalf of another person. *Relationship and Sexual Violence Prevention and Services* (RSVP) <https://engemannshc.usc.edu/rsvp/> provides 24/7 confidential support, and the sexual assault resource center webpage <https://sarc.usc.edu/reporting-options/> describes reporting options and other resources.

## **Class Notes Policy**

Notes or recordings made by students based on a university class or lecture may only be made for purposes of individual or group study, or for other non-commercial purposes that reasonably arise from the student's membership in the class or attendance at the university. This restriction also applies to any information distributed, disseminated or in any way displayed for use in relationship to the class, whether obtained in class, via email or otherwise on the Internet or via any other medium. Actions in violation of this policy constitute a violation of the Student Conduct Code, and may subject an individual or entity to university discipline and/or legal proceedings.

## **Emergency Preparedness/Course Continuity**

In case of a declared emergency if travel to campus is not feasible, the *USC Emergency Information* web site (<http://emergency.usc.edu/>) will provide safety and other information, including electronic means by which instructors will conduct class using a combination of USC's Blackboard learning management system (<https://blackboard.usc.edu>), teleconferencing, and other technologies.

Please activate your course in Blackboard with access to the course syllabus. Whether or not you use Blackboard regularly, these preparations will be crucial in an emergency. USC's Blackboard learning management system and support information are available at <https://blackboard.usc.edu>.

## COURSE CALENDAR

1	Tue 1/8	Introduction and Overview	
2	Thu 1/10	Process Measures	
3	Tue 1/15	Kristen's Cookie Company	Case 1 write-up due
4	Thu 1/17	More on Process Analysis	
Tue 1/22: No class, because M 1/21 session is cancelled due to Martin Luther King's Birthday (University holiday).			
5	Thu 1/24	Little's Law	
6	Tue 1/29	Waiting Line Management	Quiz 1 (Quiz preparation questions will be distributed on Friday 1/18)
7	Thu 1/31	Queueing Theory I	
8	Tue 2/5	Queueing Theory II	
9	Thu 2/7	The Goal + Midterm 1 Review	The Goal write-up due
10	Tue 2/12	Midterm 1	
11	Thu 2/14	Intro to Linear Optimization	
Tue 2/19: No class, because M 2/18 session is cancelled due to President's Day (University holiday).			
12	Thu 2/21	Solving Linear Optimization – Excel Solver	
13	Tue 2/26	Interpreting Linear Optimization	
14	Thu 2/28	Additional Optimization Applications	
15	Tue 3/5	Timeshare Exchange Fair	Case 2 write-up
16	Thu 3/7	Decision Tree	Quiz 2 (Quiz preparation questions will be distributed on Friday 2/22)
3/10 – 3/17: No class, Spring Break			
17	Tue 3/19	Revenue Management: Introduction	
18	Thu 3/21	Revenue Management: Dynamic Pricing	
19	Tue 3/26	Revenue Management: Capacity Controls	
20	Thu 3/28	Midterm 2 Review	
21	Tue 4/2	Midterm 2	
22	Thu 4/4	Inventory Management: EOQ	
23	Tue 4/9	Inventory Management: Uncertainty	eBeer game registration
24	Thu 4/11	Inventory Management: Continuous Review	
25	Tue 4/16	Intro to Forecasting	Quiz 3 (Quiz preparation questions will be distributed on Friday 4/5)
26	Thu 4/18	Supply Chain Dynamics	
27	Tue 4/23	Zara	Case 3 write-up due
28	Thu 4/25	Final Review	
Final	Thu 5/2	11:00am – 1:00pm	

## **Module 1: Business Process Management**

### **Session 1 – Introduction and Overview**

**Question:** What is Operations Management (OM)? Why Operations Management?

**Outline:** You and your classmates will discover that OM defines business competitiveness and study of OM prepares you to become business leaders and entrepreneurs by qualitatively and quantitatively assessing trade-offs.

**Learning Outcomes:** By the end of this session, students should be able to

- Define and identify Operations Management problems in real-world situations
- Articulate the importance of OM to business competitiveness, leadership, and entrepreneurship
- Construct and interpret business processes using process flow diagrams
- Describe the potential trade-offs in make-to-stock and make-to-order processes

### **Session 2 – Process Measures**

**Question:** How do process flows link to the profits? How do we quantify the performance?

**Outline:** You will learn that the flow of customers or products into and out of a system determines process measures and ultimately the bottom line.

**Learning Outcomes:** By the end of this session, students should be able to

- Calculate key performance measures of a process, including capacity, flow rate, and utilization rate
- Define flow time and work-in-process
- Identify the bottleneck that governs the capacity of a process

### **Session 3 – The Kristen’s Cookie Company**

**Question:** What is the makeup of a small cookie business? How do we determine capacity?

**Outline:** Through this case, you will gain a better understanding of the business profitability through business process analysis; you will evaluate key performance measures under different sales mixes, and recognize the impact of the bottleneck on price and profit.

**Learning Outcomes:** Through this case, students should be able to

- Conduct business process analysis to assess business profitability
- Evaluate key performance measures under different sales mixes
- Quantify the impact of the bottleneck on price and profit

### **Session 4 – More on Process Analysis**

**Question:** Is it possible to improve utilization rate and capacity at the same time?

**Outline:** You will study strategies to meet seasonal demand and how flexible resources help increase system capacity and utilization rate at the same time. Through several examples, we will also solidify our understanding of calculating metrics such as capacity.

**Learning Outcomes:** By the end of this session, students should be able to

- Describe strategies for meeting seasonal demand and the impact of variability/seasonality on capacity requirement
- Utilize flexible resources to increase system capacity and utilization rate at the same time
- Calculate performance measures in the presence of multiple products and yield losses

### **Session 5 – Little’s Law**

**Question:** What is Little’s Law? How can it shed insight onto business process performance?

**Outline:** There is an important relationship among key performance indicators of a process. You will learn the powerful formula to help you better understand the performance of the business processes.

**Learning Outcomes:** By the end of this session, students should be able to

- Link various performance measures using Little's Law
- Articulate related business insights
- Apply the formula in various environments

#### **Session 6 – Waiting Lines Management**

**Question:** What principles can support us in understanding and managing waiting lines?

**Outline:** We wait. Understanding *waiting* as a phenomenon enables us to create schedules, monitor inventory, analyze service, and determine a cost-effective balance for optimal performance and revenues. In this class, you will build a core understanding of three important factors pertaining to the performance of the waiting lines.

**Learning Outcomes:** By the end of this session, students should be able to

- Define characteristics of a waiting line queueing system
- Explain the effects of variability, utilization rate, and risk pooling on waiting line performance
- Describe the psychology of waiting lines

#### **Sessions 7 and 8 – Queuing Theory**

**Question:** How can mathematical calculations support optimal performance and revenues?

**Outline:** You will be able to translate real life waiting into variables for use in formulae and mathematical calculations to determine waiting line performance.

**Learning Outcomes:** By the end of this session, students should be able to

- Formulate the quantitative impact of various factors on waiting time
- Apply the formulae to calculate the waiting time of real-life waiting systems
- Explain waiting lines principles using the formulae

#### **Session 9 – “The Goal” and Midterm 1 Review**

**Question:** What is “the Goal” of a firm? How do the concepts we learned interact in a firm?

**Outline:** The book “*The Goal*” provides a nice description of the process flows, accounting measures, bottleneck management, and the concepts of the Theory of Constraints and continuous improvement. You will better understand the key concepts we have learned in a real-world setting.

**Learning Outcomes:** After reading and discussing the book “*The Goal*,” students should be able to

- Describe the connection between process flows, accounting measures, bottleneck management, as well as the concepts of the Theory of Constraints and continuous improvement in a real-world setting
- Link financial measures to operations measures
- Identify and manage bottlenecks
- Explain the effects of dependent events and statistical fluctuations on processes

#### **Session 10 – Midterm 1**

## **Module 2: Optimization**

### **Sessions 11 and 12 – Introduction to Linear Optimization and Solving Linear Optimization**

**Question:** How do we find the optimal solution? What is linear optimization? How do we solve it?

**Outline:** 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 optimization problem (LOP) and solve small LOPs using Excel Solver.

**Learning Outcomes:** By the end of this session, students should be able to

- Identify the powerful impact of optimization on business problems
- Describe components of a linear optimization problem (LOP) and its graphical representation
- Formulate a linear optimization problem and solve it using the Excel Solver

### **Session 13 – Interpreting Linear Optimization**

**Question:** How can we interpret sensitivity analysis reports when the real-life challenge is vague?

**Outline:** You will practice more advanced LOP in Excel. You will appreciate the value of the Excel reports, which help you understand and interpret how LOP solutions change when the conditions vary.

**Learning Outcomes:** By the end of this session, students should be able to

- Solve an LOP using the Excel Solver
- Interpret sensitivity analysis based on Excel reports for business insights
- Distinguish scenario analysis from sensitivity analysis

### **Session 14 – Additional Optimization Applications**

**Question:** How do Internet companies and traditional companies rely on optimization?

**Outline:** Optimization has become a backbone for many businesses. You will investigate some typical business problems where optimization is used and understand that Internet companies and traditional companies alike are embracing optimization to solve business problems.

**Learning Outcomes:** By the end of this session, students should be able to

- Describe some common optimization problems in the business world, for both Internet companies and traditional companies
- Incorporate scenario analysis into an optimization formulation

### **Session 15 – Timeshare Exchange Fair**

**Question:** How can we build a successful timeshare exchange business? What is “optimal”?

**Outline:** In this case, you will transform a business challenge into a mathematical model. You will also discover optimization is more than linear optimization and learn to formulate an integer optimization problem.

**Learning Outcomes:** Through this case, students should be able to

- Translate a business challenge into a mathematical model
- Formulate an integer optimization problem, an advancement beyond linear optimization

### **Session 16 – Decision Tree**

**Question:** How can we optimize our decision in an uncertain world? What is a Decision Tree?

**Outline:** The Decision Tree is a schematic model used to manage uncertainty by clearly identifying alternative choices. You will learn how to construct a decision tree—its nodes and branches—and solve for the optimal decision.

**Learning Outcomes:** By the end of this session, students should be able to

- Use decision trees to express alternative choices and to manage uncertainty
- Describe differences between the three types of nodes in a decision tree
- Solve decision tree problems

**Session 17** – Revenue Management: Introduction

**Question:** What is Revenue Management? How does it help business to increase profit? How to set prices?

**Outline:** You will understand the key concepts of revenue management. In this lesson, you will be use an online platform to understand how to use consumer valuation information to set prices.

**Learning Outcomes:** By the end of this session, students should be able to

- Learn how to set prices based on customer valuation information
- Employ an analytical approach to make pricing decisions.

**Session 18** – Revenue Management: Dynamic Pricing

**Question:** What if there is more information than valuations? How to exploit temporal patterns in data to extract more profit?

**Outline:** You will understand the key concepts underlying dynamic pricing (prices changing over time) and you will test your price setting skills using an online platform.

**Learning Outcomes:** By the end of this session, students should be able to

- Observe temporal patterns in data.
- Understand how to dynamically set prices in order to maximize revenue.

**Session 19** – Revenue Management: Capacity Controls

**Question:** How many seats should you reserve for your premium customers?

**Outline:** You will face an example of decision making under uncertainty by solving the capacity control problem on an online platform. You will learn the underlying marginal analysis idea that solves the capacity control problem.

**Learning Outcomes:** By the end of this session, students should be able to

- Identify the trade-offs associated with marginal analysis.
- Apply marginal analysis to the capacity control problem.

**Session 20** – Midterm 2 Review

**Session 21** – Midterm 2

### **Module 3: Inventory and Supply Chain Management**

#### **Session 22 – Inventory Management: EOQ**

**Question:** Why carry inventory? What is “economies of scale”? How can we minimize costs?

**Outline:** Inventory is essential for business activities though it can be costly. You will examine the trade-offs between economies of scale and inventory cost and learn how to find the right amount of inventory using the economic order quantity (EOQ) formula.

**Learning Outcomes:** By the end of this session, students should be able to

- Describe the different purposes for keeping inventory
- Explain the trade-offs between economies of scale and inventory cost in a basic inventory problem
- Optimize the amount of inventory using the economic order quantity (EOQ) formula
- Define inventory turns, a key performance measure

#### **Session 23 – Inventory Management: Demand Uncertainty**

**Question:** Why carry inventory? How to ensure customer satisfaction with minimum inventory?

**Outline:** Inventory is a necessary evil especially when you face demand uncertainty. You will examine the trade-offs and apply marginal analysis to solve the problem optimally. You will also be able to establish an inventory policy when both economies of scale and demand uncertainty are present.

**Learning Outcomes:** By the end of this session, students should be able to

- Identify the elements and trade-offs of a basic inventory problem
- Apply marginal analysis to optimize inventory decisions in face of demand uncertainty
- Explain the risk pooling effect in inventory systems
- Derive the (ROP, Q) inventory policy when both economies of scale and demand uncertainty are present

#### **Session 24 – Inventory Management: Continuous Review**

**Question:** We establish and analyze an inventory policy when both economies of scale and demand uncertainty are present.

**Learning Outcomes:** By the end of this session, students should be able to

- Explain the risk pooling effect in inventory systems in a dynamic manner.
- Derive the (ROP, Q) inventory policy when both economies of scale and demand uncertainty are present
- Understand the tradeoffs between uncertainty, delay, and inventory decisions.

#### **Session 25 – Introduction to Forecasting**

**Question:** How do we plan without seeing the future? What makes a good forecast?

**Outline:** Anticipating the future is no easy task. From astrologers to business managers, we try as best we can to use science and mathematics to demystify the unknown for optimal decision-making. Finance, marketing, as well as production and service, rely on forecasting to make both long-term and short-term management decisions. You will learn the basic methods to forecasting, become skilled at calculating measurement error, and understand the trade-offs between responsiveness and stability in parametric selection.

**Learning Outcomes:** By the end of this session, students should be able to

- Describe the importance of forecasting for long-term and short-term decisions in finance, marketing, production and service

- Explain basic concepts and components of forecasting
- Measure the forecast error of a forecast method
- Apply the simple moving average model and the exponential smoothing method
- Assess the trade-offs between responsiveness and stability in parametric selection

**Session 26:** Supply Chain Dynamics

**Question:** What is the “bull-whip” effect? How do our decisions influence others’ decision?

**Outline:** The success of a company relies on its upstream supplier and downstream distribution partners. Incentives and information are two crucial factors in decision making. You will play the Root Beer game to experience the information distortion in a supply chain.

**Learning Outcomes:** By the end of this session, students should be able to

- Explain the impact of two crucial factors, incentives and information, in a company’s interaction with its upstream suppliers and downstream distribution partners
- Describe the bull-whip effect, as experienced in the Root Beer Game
- Devise strategies for combating the bull-whip effect

**Session 27 – Zara**

**Question:** Have you been to a Zara store? How does Zara manage its inventory and supply chain?

**Outline:** The fashion business is demanding on inventory management because leftovers get significant markdowns. You will study and understand Zara’s supply chain structure and its inventory policy and examine how its operation strategy aligns with its business strategy.

**Learning Outcomes:** Through this case, students should be able to

- Describe the importance of inventory management in the fashion business, in light of significant markdowns for leftover inventory
- Analyze Zara’s supply chain structure and its inventory policy
- Explain how Zara’s operation strategy aligns with its business strategy

**Session 28 – Final Review**

**Final exam: Thursday, May 2, 11:00am – 1:00pm in Fertitta Hall 414 (JFF 414).**

## Contribution of BUAD311 Operations Management to Student Achievement of Marshall's Six Undergraduate Program Learning Goals

#	Marshall Program Learning Goal Description	Degree of Emphasis	BUAD311 Course Objectives that Support This Marshall Undergraduate Goal
<b>1</b>	<b>Our graduates will understand types of markets and key business areas and their interaction to effectively manage different types of enterprises. Specifically, students will:</b>	<b>High</b>	<b>BUAD311 Course Objectives 1-7 support Goal 1</b>
1.1	Demonstrate foundational knowledge of core business disciplines, including business analytics and business economics.		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain
1.2	Understand the interrelationships between functional areas of business so as to develop a general perspective on business management.		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
1.3	Apply theories, models, and frameworks to analyze relevant markets (e.g. product, capital, commodity, and factor and labor markets).		2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 4. Learn waiting line and revenue management 5. Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
1.4	Show the ability to utilize technologies (e.g., spreadsheets, databases, software) relevant to contemporary business practices.		6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix 8. Communicate case analysis with team presentations
<b>2</b>	<b>Our graduates will develop a global business perspective. They will understand how local, regional, and international markets, and economic, social and cultural issues impact business decisions so as to anticipate new opportunities in any marketplace</b>	<b>Low</b>	<b>BUAD311 Course Objectives 1-7 support Goal 2</b>
2.1	Understand how local, regional and global markets interact and are impacted by economic, social and cultural factors.		1. Understand interfaces with other functional areas 3. Understand the global nature of supply chain
2.2	Understand that stakeholders, stakeholder interests, business environments (legal, regulatory, competitor) and business practices vary across regions of the world.		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 5. Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques
<b>3</b>	<b>Our graduates will demonstrate critical thinking skills so as to become future-oriented decision makers, problem solvers and innovators. Specifically, students will:</b>	<b>High</b>	<b>BUAD311 Course Objectives 1-7 support Goal 3</b>
3.1	Understand the concepts of critical thinking, entrepreneurial thinking and creative thinking as drivers of innovative ideas.		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 4. Learn waiting line and revenue management 5. Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
3.2	Critically analyze concepts, theories and processes by stating them in their own words, understanding key		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making

	components, identifying assumptions, indicating how they are similar to and different from others and translating them to the real world.		4. Learn waiting line and revenue management 5 Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
3.3	Be effective at gathering, storing, and using qualitative and quantitative data and at using analytical tools and frameworks to understand and solve business problems.		4. Learn waiting line and revenue management. 5 Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
3.4	Demonstrate the ability to anticipate, identify and solve business problems. They will be able to identify and assess central problems, identify and evaluate potential solutions, and translate a chosen solution to an implementation plan that considers future contingencies		1. Understand interfaces with other functional areas. 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 4. Learn waiting line and revenue management. 5 Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques 7. Formulate a linear program for optimal product-mix
4	<b>Our graduates will develop people and leadership skills to promote their effectiveness as <i>business managers and leaders</i>. Specifically, students will:</b>	<b>Mode rate</b>	<b>BUAD311 Course Objectives 1-7 support Goal 4</b>
4.1	Recognize, understand, and analyze the motivations and behaviors of stakeholders inside and outside organizations (e.g., teams, departments, consumers, investors, auditors).		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making 3. Understand the global nature of supply chain 4. Learn waiting line and revenue management
4.2	Recognize, understand and analyze the roles, responsibilities and behaviors of effective managers and leaders in diverse business contexts e.g., marketing, finance, accounting.		1. Understand interfaces with other functional areas 6. Apply operations management tools/techniques
4.3	Understand factors that contribute to effective teamwork.		5 Apply process analysis and capacity management skills to manage a factory in real-time 6. Apply operations management tools/techniques
5	<b>Our graduates will demonstrate ethical reasoning skills, understand social, civic, and professional responsibilities and aspire to add value to society. Specifically, students will:</b>	<b>Low</b>	<b>BUAD311 Course Objectives 1-2 support Goal 5</b>
5.1	Understand professional codes of conduct.		1. Understand interfaces with other functional areas
5.2	Recognize ethical challenges in business situations and assess appropriate courses of action.		1. Understand interfaces with other functional areas 2. Analyze trade-offs in decision-making
6	<b>Our graduates will be effective communicators to facilitate information flow in organizational, social, and intercultural contexts. Specifically, students will:</b>	<b>Mode rate</b>	<b>BUAD311 Course Objectives 1 and 6 support Goal 6</b>
6.1	Identify and assess diverse personal and organizational communication goals and audience information needs		1. Understand interfaces with other functional areas 6. Apply operations management tools/techniques
6.2	Understand individual and group communications patterns and dynamics in organizations and other professional contexts		
6.3	Demonstrate an ability to gather and disseminate information and communicate it clearly, logically, and persuasively in professional contexts.		6. Apply operations management tools/techniques, create and defend well-reasoned solutions