

|                    |                                    |                           |
|--------------------|------------------------------------|---------------------------|
| <b>Instructor:</b> | <b>Kathy Takayama</b>              | <b>Mika Sumida</b>        |
| Zoom:              | Check "BB/Contacts" for zoom links |                           |
| Email              | Kathy.Takayama@marshall.usc.edu    | mikasumi@marshall.usc.edu |
| Slack DM           | @Kathy Takayama                    | N/A                       |
| Office Hours:      | BRI-401T                           |                           |
|                    | Tue, 2:00-3:00 (Zoom) and          | TBA                       |
|                    | Thu, 1:00-2:00 (BRI-401T)          |                           |
|                    | Or by appointment                  |                           |

---

## **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. 15-17 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:

- Goal 1: Describe the spectrum of operations management activities in a business, and the types of decisions made by operations managers.
- Goal 2: 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.
- Goal 3: Predict, anticipate, and take into account how operations management interfaces with other functional areas such as strategy, accounting, finance, human resources, and marketing.

- Goal 4: Demonstrate critical thinking skills to assess trade-offs in process design, capacity allocation, inventory levels, and customer service.
- Goal 5: Apply optimization tools and techniques to practical problems; for example, use the Excel Solver to formulate and solve a linear optimization problem.
- Goal 6: Apply critical thinking and problem-solving and make real-time decisions on capacity, quoted lead-times, work-in-process levels, contracts, and inventory.
- Goal 7: 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. You may choose to purchase a copy of the custom BUAD 311 textbook or access pertinent chapters from ARES at no cost (see below).

- *BUAD 311 Operations Management*: Custom-made textbook available in eBook format at <https://www.mheducation.com/highered/custom/product/9781121107915.html> ISBN: 9781308430478. (*This is optional*)
- Four relevant chapters (Textbook chapters 2, 3, 8 and LP with Solver) from the text are available for free on ARES Course Reserves by clicking on the ARES link on the navigation bar on Blackboard
- *EBeer Game*: During the 2<sup>nd</sup> half of the semester, we will experience what it feels like to be a Supply Chain partner in a simulation where we move cases of beer from manufacturer to customer. Students will be provided instructions how to register well before the day we play. Registration costs \$10 (subject to change) per student.

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

Co-requisite: BUAD 310 or BUAD 312 or EE 364 or MATH 407

### **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.

### **Copyright Notice**

For the in-person lectures, the Panopto recordings will be posted on BB after the class. **No student may record any lecture, class discussion, office hours or meeting with the instructor without prior express written permissions.** It is a violation of USC's Academic Integrity Policies to share course materials with others without permission. 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 OSAS and the instructor.

## ASSIGNMENTS AND GRADING DETAIL

|                             |     |
|-----------------------------|-----|
| Participation               | 6%  |
| Write-ups (2 cases)         | 4%  |
| Quizzes and Exams           |     |
| • Quizzes (best 3 out of 4) | 30% |
| • Midterm                   | 30% |
| • Final Exam                | 30% |

There will be absolutely no other assignments.

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 the 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.

### Write-ups

There will be two write-ups for the course, one for each of the two cases. Each contributes 2% to the course grade. Write-ups are short essays/analyses 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.** 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.

### Quizzes

There are four quizzes, of which the best three will count towards the course grade for 10% 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, 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. Unless stated otherwise, all quizzes are closed books and there are no crib-sheets permitted for quizzes. Quizzes will be online through Blackboard. Each quiz will be available in a 24-hour window, where you can start the quiz and it will be given 25 minutes to complete. Collaboration of any sort on quizzes is strictly prohibited and may 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.

### Midterm and Final Exam

There is a midterm exam and a final exam; the final exam is **non-cumulative**. All exams are closed books. Each student may bring two letter-sized (8.5"x11") double-sided crib sheets for the

midterm and the final exams. 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 may 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 4, 11:00 AM - 1:00 PM.** 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 exams at the indicated times and dates, in their enrolled sections. If you foresee a conflict, you must contact the instructor within the first three weeks of the semester to explore alternative options, to be determined by the entire 311 teaching team. No rescheduling of exams will be allowed after the first three weeks of class.** 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 a quiz or 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 a quiz or an exam will result in a zero for the quiz or the exam.

## **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. Please refer to [USC Schedule of Classes](#) for registration calendar.

### **Class Notes Policy**

Notes 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.

### **Use of Recordings**

Pursuant to the USC Student Handbook ([www.usc.edu/scampus](http://www.usc.edu/scampus), Part B, 11.12), students may not record a university class without the express permission of the instructor and announcement to the class. In addition, students may not distribute or use notes or recordings based on University classes or lectures without the express permission of the instructor for purposes other than personal or class-related group study by individuals registered for the class. This restriction on unauthorized use applies to all information that is distributed or displayed for use in relationship to the class.

### **Open Expression and Respect for All**

An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one's beliefs. In this course we will support the values articulated in the USC Marshall "[Open Expression Statement](#)."

### **Class Conduct**

Professionalism will be expected at all times. Because the university classroom is a place designed for the free exchange of ideas, we must show respect for one another in all circumstances. We will show respect for one another by exhibiting patience, courtesy, and professionalism in our exchanges. Appropriate language and restraint from verbal attacks upon those whose perspectives differ from your own is a requirement. Courtesy and kindness are the norm for those who participate in my class.

## **Statement on Academic Conduct and Support Systems**

### **Academic Integrity**

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even ex-pulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

### **Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](http://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

#### **Support Systems:**

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) pro-vides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

# BUAD 311 COURSE CALENDAR

|  |                  |  |                                    |
|--|------------------|--|------------------------------------|
| 1  | M 1/9 & T 1/10   | Introduction and Overview                        |                                    |
| 2  | W 1/11 & Th 1/12 | Process Measures                                 |                                    |
| M 1/16 & T 1/17: No Class for Martin Luther King Day |                  |  |                                    |
| 3  | W 1/18 & Th 1/19 | Kristen's Cookie Company                         | Case write-up<br>Due date on BB    |
| 4  | M 1/23 & T 1/24  | More on Process Analysis                         |                                    |
| 5  | W 1/25 & Th 1/26 | Little's Law                                     |                                    |
| 6  | M 1/30 & T 1/31  | Waiting Line Management                          | Quiz 1                             |
| 7  | W 2/1 & Th 2/2   | Queueing Theory I                                |                                    |
| 8  | M 2/6 & T 2/7    | Queueing Theory II                               |                                    |
| 9  | W 2/8 & Th 2/9   | Intro to Linear Optimization                     |                                    |
| 10   | M 2/13 & T 2/14  | Solving Linear Optimization – Excel Solver       | Quiz 2                             |
| 11   | W 2/15 & Th 2/16 | Interpreting Linear Optimization                 |                                    |
| M 2/20 & T 2/21: No Class for Presidents' Day        |                  |  |                                    |
| 12   | W 2/22 & Th 2/23 | Additional Optimization Applications             |                                    |
| 13   | M 2/27 & T 2/28  | Bonus Operations Topics                          |                                    |
| 14   | W 3/1 & Th 3/2   | Midterm 1 Review                                 |                                    |
| 15   | M 3/6 & T 3/7    | <b>Midterm 1</b>                                 |                                    |
| 16   | W 3/8 & Th 3/9   | Decision Trees                                   |                                    |
| M 3/13 - Th 3/16: No Class for Spring Recess         |                  |  |                                    |
| 17   | M 3/20 & T 3/21  | Revenue Management: Introduction & Pricing       |                                    |
| 18   | W 3/22 & Th 3/23 | Revenue Management: Price Discrimination         |                                    |
| 19   | M 3/27 & T 3/28  | Intro to Supply Chain Management                 |                                    |
| 20   | W 3/29 & Th 3/30 | Inventory Management: EOQ                        | Quiz 3                             |
| 21   | M 4/3 & T 4/4    | Inventory Management: Uncertainty and Newsvendor |                                    |
| 22   | W 4/5 & Th 4/6   | Inventory Management: Continuous Review          |                                    |
| 23   | M 4/10 & T 4/11  | Forecasting I                                    |                                    |
| 24   | W 4/12 & Th 4/13 | Forecasting II                                   | Quiz 4<br>EBEER registration       |
| 25   | M 4/17 & T 4/18  | EBeer Game (in class)                            |                                    |
| 26   | W 4/19 & Th 4/20 | Topic TBA  |                                    |
| 27   | M 4/24 & T 4/25  | Case Discussion: Supply-Chain                    | Case Write-up<br>Due date on BB    |
| 28   | W 4/26 & Th 4/27 | Final Exam Review and Wrap-up                    |                                    |
| Final  | Th May 4         | <b>Final Exam:</b> 11 am–1 pm                    | See BB for room and other details. |



## **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 – 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 Line 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

## **Module 2: Optimization**

### **Sessions 9 and 10 – 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)
- Formulate a linear optimization problem and solve it using the Excel Solver

### **Session 11– 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 12– 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 13 – Bonus Operations Topics**

**Question:** If Operations Management is all about converting inputs into customer value in the most efficient and effective way possible, what other applications might I see in the real world?

**Outline:** Professor Takayama will be your Guest Speaker, sharing her decades of business experiences, as a Project and Program Manager as well as Operations Officer, and Chief of Staff for a large business unit at Hewlett Packard. We will also discuss certifications that could be in your future if decide to continue in this field of Operations.

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

- Describe the role of Project and Program Management in the field of Operations
- Understand the difference between Agile, Lean, and Six Sigma
- Learn some tools to improve processes in your professionally and personally
- Know which certifications are achievable in the short term, and which should be longer term future targets

### **Session 14 – Midterm Review**

### **Session 15 – Midterm Exam**

### **Session 16 – Decision Trees**

**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 and Pricing**

**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 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: Price Discrimination**

**Question:** Does everyone pay the same price for the same product?

**Outline:** Price discrimination is pervasive in modern markets, often through coupons, rebates, and targeted advertising. You will learn the basic ideas behind price discrimination and a particular way price discrimination is often implemented called dynamic pricing.

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

- Compute optimal prices for given segmentation of a market
- Weigh costs and benefits of price discrimination strategies for a business
- Implement dynamic pricing strategies from data

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

#### **Session 19 – Intro to Supply Chain Management**

**Question:** What does it take to get products to customers? How do raw materials evolve into finish products that end up on store shelves?

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

- Recognize which supply chain partners are upstream and downstream
- Understand what flows upstream and downstream

#### **Session 20 – 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 21 – Inventory Management: Uncertainty and Newsvendor**

**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 the 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 22– 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 23 and 24 – 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 these sessions, 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

### **Session 25 – EBeer Game**

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

**Learning Outcomes:** 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 EBeer game to experience the information distortion in a supply chain.

- Experience the bull-whip effect via the EBeer game
- Understand this common business phenomenon
- Learn how to combat the bull-whip effect

### **Session 26 – Topic TBA**

### **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 4, 11:00 AM - 1:00 PM**

## 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 Learning Goals that Support This Marshall Undergraduate Goal  |
|-----|---|--------------------|--|
| 1   | <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>   | High               | <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<br>2. Analyze trade-offs in decision-making<br>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<br>2. Analyze trade-offs in decision-making<br>3. Understand the global nature of supply chain<br>6. Apply operations management tools/techniques<br>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<br>3. Understand the global nature of supply chain<br>4. Learn waiting line and revenue management<br>5. Apply process analysis and capacity management skills to manage a factory in real-time<br>6. Apply operations management tools/techniques<br>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<br>7. Formulate a linear program for optimal product-mix   |
| 2   | <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> | Low                | <b>BUAD311 Course Learning Goals 1, 2, 3, 5, and 6 support Marshall 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<br>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<br>2. Analyze trade-offs in decision-making<br>3. Understand the global nature of supply chain<br>5. Apply process analysis and capacity management skills to manage a factory in real-time<br>6. Apply operations management tools/techniques  |
| 3   | <b>Our graduates will demonstrate critical thinking skills so as to become future-oriented decision makers, problem solvers and innovators. Specifically, students will:</b>  | High               | <b>BUAD311 Course Learning Goals 1-7 support Marshall Goal 3</b>   |

|     |  |                 |   |
|-----|--|-----------------|---|
| 3.1 | Understand the concepts of critical thinking, entrepreneurial thinking and creative thinking as drivers of innovative ideas.   |                 | <ol style="list-style-type: none"> <li>1. Understand interfaces with other functional areas</li> <li>2. Analyze trade-offs in decision-making</li> <li>3. Understand the global nature of supply chain</li> <li>4. Learn waiting line and revenue management</li> <li>5 Apply process analysis and capacity management skills to manage a factory in real-time</li> <li>6. Apply operations management tools/techniques</li> <li>7. Formulate a linear program for optimal product-mix</li> </ol>   |
| 3.2 | Critically analyze concepts, theories and processes by stating them in their own words, understanding key components, identifying assumptions, indicating how they are similar to and different from others and translating them to the real world.                              |                 | <ol style="list-style-type: none"> <li>1. Understand interfaces with other functional areas</li> <li>2. Analyze trade-offs in decision-making</li> <li>4. Learn waiting line and revenue management</li> <li>5 Apply process analysis and capacity management skills to manage a factory in real-time</li> <li>6. Apply operations management tools/techniques</li> <li>7. Formulate a linear program for optimal product-mix</li> </ol>  |
| 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.  |                 | <ol style="list-style-type: none"> <li>4. Learn waiting line and revenue management.</li> <li>5 Apply process analysis and capacity management skills to manage a factory in real-time</li> <li>6. Apply operations management tools/techniques</li> <li>7. Formulate a linear program for optimal product-mix</li> </ol>   |
| 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 |                 | <ol style="list-style-type: none"> <li>1. Understand interfaces with other functional areas.</li> <li>2. Analyze trade-offs in decision-making</li> <li>3. Understand the global nature of supply chain</li> <li>4. Learn waiting line and revenue management.</li> <li>5 Apply process analysis and capacity management skills to manage a factory in real-time</li> <li>6. Apply operations management tools/techniques</li> <li>7. Formulate a linear program for optimal product-mix</li> </ol> |
| 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>Moderate</b> | <b>BUAD311 Course Learning Goals 1-6 support Marshall 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).  |                 | <ol style="list-style-type: none"> <li>1. Understand interfaces with other functional areas</li> <li>2. Analyze trade-offs in decision-making</li> <li>3. Understand the global nature of supply chain</li> <li>4. Learn waiting line and revenue management</li> </ol>   |
| 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.   |                 | <ol style="list-style-type: none"> <li>1. Understand interfaces with other functional areas</li> <li>6. Apply operations management tools/techniques</li> </ol>   |
| 4.3 | Understand factors that contribute to effective teamwork.  |                 | <ol style="list-style-type: none"> <li>5 Apply process analysis and capacity management skills to manage a factory in real-time</li> <li>6. Apply operations management tools/techniques</li> </ol>   |

|     |  |                 |   |
|-----|--|-----------------|---|
| 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 Learning Goals 1 and 2 support Marshall 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<br>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>Moderate</b> | <b>BUAD311 Course Learning Goals 1 and 6 support Marshall 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<br>6. Apply operations management tools/techniques |
| 6.2 | Understand individual and group communications patterns and dynamics in organizations and other professional contexts  |                 |   |