



OPERATIONS MANAGEMENT

The Fuqua School of Business
EGRMGMT 562
Fall 2024



Professor	Pranab Majumder
Office	Magat A234, Fuqua School of Business
Email	majumder@duke.edu
Phone	(919) 660-7694
Course Website	Duke Canvas
Teaching Assistant	Tarun Srivathsa

Course Description

Operations management involves planning and controlling the processes used to produce the goods and services provided by an organization. In essence, it is the management of all activities related to doing the actual work of the organization. Managing these processes can be quite challenging—they are often very complex, and can involve large numbers of people and facilities, huge volumes of materials and great distances.

Managed well, an organization's operations can be a key source of competitive advantage. They can play a critical role in facilitating an organization's marketing strategy, and they can enable an organization to deliver its products or services with high quality at low cost. Managed poorly, operations can be a significant contributor to disappointing results. As a result, a fundamental understanding of operations management is important for all managers within an organization.

Specific objectives of the course are to:

- Introduce you to the functional area of operations and to increase your awareness of how a firm's operations interface with the other functional areas of the organization.
- Familiarize you with the various issues and problems that traditionally arise in the management of operations within both manufacturing and service organizations.
- Acquaint you with some of the terminology, modeling, and methodologies that often arise in the handling and resolution of these issues and problems.

Readings and Course Pack

Each student must purchase a course pack containing the cases and a few readings. The purchase link will be available on the learning platform.

Additional readings from current business press will be posted on the platform.

Grading

- **Distribution:**

Class Participation	Team	• In-Class (campus students) • Case Presentation (1 or 2)	10%
Online Quizzes	Individual	On Canvas	30%
Final Exam	Individual	On Canvas	35%
Simulation	Team of 4	Littlefield Technologies	25%
Optional Paper	Individual	Report, PPT	(10%)

Your grade will depend upon your individual grade components **subject to** your participation in the team components.

- **Team:** For team assignments, a team should consist of **4 students**. Please send me an e-mail with a list of your team members (one e-mail per team) by/after the first class. I may change team composition at my discretion.
- **Quizzes:** We will have timed Canvas quizzes which are due before almost every class (they may not all have equal weight). These will be short numerical or descriptive questions that have to be answered by you individually, and are designed to focus our minds on the topic for the class.
- **Class Participation:** Successful class participation requires regular attendance and regular and positive contributions to case and class discussions. For everyone to get the most out of each class session, it is necessary that all students read the assigned materials and come to class prepared to participate constructively in the discussion. Students are encouraged to share their relevant work experience as part of class discussion. Discussion questions will be provided for each of the class sessions. Students should use these questions as a starting point and rough guide for thinking about the material in the readings. The components are:
 - In-Class discussion contribution (for campus students)
 - Write-ups on the discussion topics or current articles on the discussion board (for distance students)
- **Case Presentations:** Each team will have to present cases in class. We will ask for your team preferences, and will try to match your case assignments to your preferences, if possible. The

case presentations should address the case questions, and be planned for **15 minutes**, plus 5 minutes for Q&A. Please have a cover slide with the names of all team members.

- **Optional Individual Paper:** You may choose to write an individual optional paper on an operations management topic, which must be (a) about the operations of a company you have personally worked with, or interacted with (b) about your own interaction/employment with the operations of that company, and (c) use one of the models or frameworks covered in the course. This optional paper may be used to improve your grade only if your course grade lands up **below B+**. Thus, I will calculate your grade based on the mandatory components of the course, and then if your paper covers all the requirements, it will be used to improve your grade by one step (e.g. from B- to B, or B to B+, but not from B+ to A- or higher). The report must be 3 pages long, single-spaced, 12-point font (plus an additional cover page, and any additional appendices). If you choose to present in the last class, you may have up to 15 minutes (depending on the number of students who choose to submit an optional paper).

Attendance

It is crucial that on-campus students attend all the class sessions. If you cannot attend a particular class due to illness or other special commitments, please send email to me, preferably ahead of the class that you will be missing.

(Superseded by any University-wide guidelines or issues.)

Honor Code

The Honor Code will be strictly self-enforced in this class. It is each student's responsibility to understand and abide by the Honor Code as it applies to each class activity.

In regard to the **individual assignments**, all work is to be done on an **individual** basis. You may not discuss or exchange information regarding questions or answers with others either inside or outside of this class. In exams, asking anyone other than the professor to interpret a question is a violation of the Honor Code.

For the **team write-ups**, all work is to be done by **individual teams**—team members may not discuss or exchange information regarding the case analysis with members of other teams.

In regard to **preparation for class discussion** involving readings, exercises or cases which you are not required to write up, you may discuss the material with other members of the class.

You may not reference notes from, or exchange information with, students from previous years.

You also may not access solutions, analyses, etc. of cases that you are assigned to write up or that will be discussed in class.

With generative AI being widely available, your use of such tools is your own responsibility. That means, if the generative AI gives you incorrect or misleading answers, you will see the consequences of that. We may restrict your use of such tools during timed assignments and exams.

Failure to adhere to any of these requirements constitutes a violation of the Honor Code. If there is any question as to whether an activity is or is not permissible (in this class) under the Honor Code, consult the professor prior to undertaking the activity.

Classroom Norms

We will set up the classroom norms for the class based on what enables every one of us to learn in a supportive manner. Here are some of the norms I have used in the past, and will use in this class as well:

- **No cellphone or smartwatch** use in class. You may use laptops for only class-related activities.
- Please have your **name tents** placed in front of you for every class.
- Please come prepared and ready to **discuss/answer** when called upon.
- Please **sit at the front** of the class.

1: Introduction

<u>Case:</u> “Benihana of Tokyo” (Sasser jr, Klug), HBSP Case 673057-PDF-ENG (2004)	<u>Readings:</u> “Operations-Based Strategy”, California Management Review, Summer 1998
Case Questions: 1. What are the operational components of Benihana’s strategy and its competitive advantages? 2. How does Benihana’s cost structure differ from that of a typical sit-down restaurant? What operational and design choices generate efficiencies? 3. Try to estimate the maximum customer waiting time in the bar on a busy night in each of the three restaurant configurations (Benihana West, East, and Palace).	Topic Questions: 1. Why is Operations important for strategy? 2. Provide one example of a recent operations-based successful firm. 3. What are some of the challenges for operations in today’s business and economic environment?

For the Benihana process calculations, please assume that:

- a. Total dining time equals 60 minutes (per table of 8), and dining start times are evenly spaced.
- b. Benihana West has 8 seats in the bar and 40 in the dining room, Benihana East has 16 seats in the bar and 80 in the dining room, and Benihana Palace has 56 seats in the bar and 120 in the dining room.

Calculate the maximum wait time in the bar on a busy night, i.e., the wait time of the “last customer” to get a seat in the bar. Ignore any customers that might be waiting outside the bar.

2: Process Analysis I

We will look at a few problems from the Process Analysis teaching note. Please come prepared to discuss all the problems from the Process Analysis teaching note.

3: Process Analysis

<u>Case:</u> “Executive Shirt Company, Inc.” HBSP Case 696071-PDF-ENG (1995)	<u>Readings:</u>
Case Questions: 1. Prepare a process flow diagram for the current method followed in the factory. Compute the basic performance metrics (processing rate, cycle time, WIP, throughput time) for each stage and the facility as a whole. What is the bottleneck? 2. Do the same for both of the newly recommended plans (Mike’s and Ike’s). 3. Which plan would you recommend? Would you recommend any modifications to that plan, or some other hybrid plan of your own? Calculate the performance metrics for your plan as well.	Topic Questions:

We will look at a few problems from the Process Analysis teaching note. Please come prepared to discuss all the problems from the Process Analysis teaching note.

4: Queueing

<u>Case:</u> “Paediatric Orthopaedic Clinic at the Children’s Hospital of Western Ontario” Ivey Case 908D01 (2008)	<u>Readings:</u> Queueing Analysis (Fuqua Teaching Note)
Case Questions: 1. Prepare a process flow diagram for the clinic, and calculate activity utilization at every step. 2. How is variability affecting capacity at the clinic? How can variability be controlled? 3. What is the bottleneck in the process? What are the capacity constraints at the clinic? 4. What is the economic cost of wait times? 5. What recommendations will you make, and why?	Topic Questions: 1. Think of some examples of waiting in a line in your life, often every day. What causes this waiting? 2. When do you dislike waiting much more? Can businesses do anything to reduce this customer dislike? Is there any situation where you or someone else likes waiting?

We will look at a few problems from the teaching note. Please come prepared to discuss all the problems from the Queueing Analysis teaching note.

5: Service Operations

<u>Case:</u> “Breakfast at the Paramount” (Buell) HBSP Case 9-617-011 (2020)	<u>Readings:</u>
Case Questions: 1. Prepare a process flow diagram for the restaurant. How does the seating policy affect the capacity and utilization of the various resources at the restaurant? Why do customers have to wait a long time at some times? 2. How does an increase in takeout orders affect this operation? What advice do you have for Michael Conlon about responding to the increase in takeout orders? 3. What are the positive and negative aspects of the customer’s service experience at Paramount? You may try to calculate waiting time for Paramount customers using the M/M/1 model.	Topic Questions: 1. How are service operations different from product or manufacturing operations? 2. How do we define quality for a service from the point of view of customers? How do we measure service quality in an objective and quantitative way? 3. Consider one company that has a superlative service operation. What do you like about this companies’ service? (Service industries include airlines, education and training, health care, legal, finance, music, movies, gaming, design, and many more).

6: Retail and Logistics

<u>Case:</u> “IKEA: Becoming a Circular Business”, Wilson Heilgenberg, 2023 Ivey Publishing	<u>Readings:</u>
Case Questions: 1. What is a circular economy? 2. What are the key differences between forward logistics and reverse logistics? 3. What are the strengths and weaknesses of IKEA’s sell-back program? 4. To what extent is IKEA engaging in sustainable marketing?	Logistics comprises of all the forward distribution activities after manufacturing, and can be divided into two main parts- storage (i.e. warehouses), and transportation (in various modes, e.g. water, air, road, etc.). Topic Questions: 1. What are the characteristics of the distribution logistics (i.e. transportation, warehouses and other assets and systems) that a specific firm chooses? (If you want to compare, please choose from the following- cars, ice cream, lettuce, books and refrigerators.) 2. What are the differences between transporting objects and transporting people? 3. What is the difference between a hub-and-spoke network and a point-to-point network? 4. What is the “last mile problem”? Find two examples of innovative attempts to solve the last mile problem.

8: Inventory Management I

<u>Case:</u> “Seven-Eleven Japan” (Whang), HBSP Case GS-18 (2006)	<u>Readings:</u> “Inventory Management” Fuqua School of Business teaching note
Case Questions: 1. How does a SEJ store compare with a large retailer in terms of customer base, SKUs, stocking and replenishment policies and information systems? 2. What is the information feedback loop that drives the store item assortment, day-to-day order policies and distribution logistics? 3. How does this impact SEJ’s store opening policies and their new product introduction policies? 4. Although not mentioned much in the case, how do you think this impacts SEJ’s suppliers?	Topic Questions:

9: Lean Production

<u>Case:</u> “Toyota Motor Manufacturing USA, Inc.” HBSP Case 693019-PDF-ENG	<u>Readings:</u> “Decoding the DNA of the Toyota Production System” HBR Sept-Oct 1999
Case Questions: 1. Consider the following terms mentioned in the case: muda, jidoka, just-in-time, heijunka, kanban, kaizen. What role does each of these concepts play in the Toyota Production System, and how do these concepts support/enable each other? 2. Does Toyota respond just-in-time to customer orders? What does it do just-in-time? 3. We've talked a lot about inventory during the last two classes, particularly the factors affecting how much inventory we should hold. Lean production focuses on keeping inventory levels low. In light of what we've discussed about inventory (and queuing and process analysis, for that matter), what things is Toyota doing to make this possible? 4. As Doug Friesen, what would you do to address the seat problem? Where would you focus your attention and solution efforts? 5. Where, if at all, does the current procedure for handling defective seats deviate from TPS principles?	Topic Questions: 1. How is the Toyota production system different from the conventional automobile manufacturing system on the following dimensions? a. Product Design b. Assembly Line Design c. Quality Management d. Responding to product changes e. Responding to demand changes.

10: Quality

<u>Case:</u> “Deutsche Allgemeinversicherung” (Upton), HBSP Case 9-696-084 (1997)	<u>Readings:</u> “Constructing and Using Process Control Charts”, HBSP Note 686118-PDF-ENG “Quality”, Fuqua Teaching Note, 2020
Case Questions: 1. What motivates DAV to implement Statistical Process Control now? 2. What are the challenges in implementing SPC at an insurance company? 3. What should Annette Kluck’s next step be in DAV’s quality efforts? 4. Exhibit 4 presents some data for the Policy Extension Group. Consider the first 12 weeks of the data to represent the diagnostic period. We will use this data to determine if the subsequent weeks’ data shows the “process” to be in control. (you may need to read section 1.1 of the Fuqua Quality Teaching Note).	Topic Questions: 1. Please read the process control note for this class. 2. What are the challenges in implementing SPC at service organizations? 3. What do you know about the history of quality and process improvement?

11: Revenue Management

<u>Case:</u> “Cambridge Software Corporation” (Dhebar), HBSP Case 9-191-072 (2009)	<u>Readings:</u> “Note on Project Management” HBSP Note W92C44-PDF-ENG “How to Fail in Project Management (Without Really Trying)” HBSP BH010-PDF-ENG
Case Questions: 1. Calculate this: If Cambridge software offers only one version of modeler, which version should it offer, and at what price? (You can do this by trying to calculate what their profits will be based on which version they sell, and the price at which they sell it. If the price is less than what customers value the product at, the customers will buy it.) 2. Try this (we will do this in class): Should the firm offer more than one version? If yes, then which versions, and at what prices? (This is a bit more involved- for multiple products, customers will decide which product to buy based on the product that gives them the highest “net utility”, i.e. their value for the product, minus the price they pay for it.)	Topic Questions: 1. What is Project Management, and what are the metrics that we can use to evaluate a project? 2. Please read up PERT/CPM, and list what you need to know in order to determine a project schedule. 3. What are the additional considerations when you are responsible for project management?

Schedule Summary

Class	Date	Topic	Case/Readings	Due
1	Aug 26	Introduction	“Benihana of Tokyo” “Operations-Based Strategy”, California Management Review, Summer 1998	
	Sep 02	(Labor Day)		
2	Sep 09	Process Analysis I	“Process Analysis” Fuqua School of Business teaching note	
3	Sep 16	Process Analysis II	“Executive Shirt Company, Inc.” HBSP Case 696071-PDF-ENG (1995)	
4	Sep 23	Queuing	“Queueing Analysis” Fuqua School of Business teaching note “Paediatric Orthopaedic Clinic at the Children’s Hospital of Western Ontario” HBSP Case 908D01-PDF-ENG	Assignment 1 (PA)
5	Sep 30	Service Operations	“Breakfast at the Paramount” (Buell) HBSP Case 9-617-011 (2020)	
6	Oct 07	Retail and Logistics	“IKEA: Becoming a Circular Business” HBSP Case W27343	Assignment 2 (Queueing)
	Oct 14	Fall Break		
7	Oct 21	Inventory I	“Inventory Management” Fuqua School of Business teaching note	(Littlefield Start)

8	Oct 28	Inventory II	“Seven-Eleven Japan” (Whang), HBSP Case GS-18 (2006)	
9	Nov 04	Lean Production	“Toyota Motor Manufacturing USA, Inc.” HBSP Case 693019-PDF-ENG “Decoding the DNA of the Toyota Production System” HBR Sept-Oct 1999	Assignment 3 (Inventory)
10	Nov 11	Quality	“Constructing and Using Process Control Charts”, HBSP Note 686118-PDF-ENG “Deutsche Allgemeinversicherung” (Upton), HBSP Case 9-696-084 (1997)	(Littlefield End) Paper Topic
11	Nov 18	Revenue Management	“Note on Project Management” HBSP Note W92C44-PDF-ENG “Cambridge Software Corporation” (Dhebar), HBSP Case 9-191-072 (2009)	
12	Nov 25		Littlefield Debrief Conclusion	Team Littlefield Report, Optional Paper

Subject to minor modifications.