

# SCM 551: OPERATIONS PLANNING AND EXECUTION

Fall 2024 (Quarter V)  
W.P. Carey School of Business, Arizona State University

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<b>Contact</b>	Canvas Messages
<b>Class Hours</b>	1:35pm – 4:05pm (Monday and Wednesday) MCRD 258.
<b>Office Hours</b>	4:15pm – 5pm (Monday and Wednesday) BA 427

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## Course Pages

1. [Canvas](#): All course content such as announcements, slides, homework, grades and other required reading will be made available on Canvas. Contact me through messages.

**Required Material** The following material are required for the course.

1. Massachusetts General Hospital's Pre-Admission Testing Area (download the inspection copy for free [here](#))
2. The Bullwhip Effect in Supply Chains, by Lee, Padmanabhan and Wang (available for free [here](#)).
3. A case packet available at [HBP: Case Packet 1202100](#). Cost = \$14.85. Your case packet contains the following cases/articles:
  - (a) Innovation at Uber: The Launch of Express POOL,
  - (b) Paper and More,
  - (c) Hewlett-Packard Co.: DeskJet Printer Supply Chain (A).
4. One simulation games will be played in the last session of the course – I will provide a link in-class. Approximate cost = \$24.

**Data Requirements** Any supplemental data required to complete homeworks will be provided on Canvas.

**Supplementary Material** This is a small list of additional resources that will be useful during the course.

- Novel: *The Goal: A Process of Continuous Improvement* by Eliyahu Goldratt and Jeff Cox. Approximate Cost = \$21 (new), \$5 (used).
- Access to a spreadsheet software (e.g., Microsoft Excel). See [here](#) for access to Microsoft Excel through ASU.
- R and R Studio: Both R and R Studio are available for free – See [here](#) for details. There are plenty of resources online; please contact me if you have any questions regarding installation and/or use.
- Python, Jupyter Notebooks and VS Code – See [here](#) and [here](#) for details. There are plenty of resources online; please contact me if you have any questions regarding installation and/or use.
- Gerard Cachon, Christian Terwiesch, *Matching Supply with Demand: An Introduction to Operations Management*, McGraw-Hill, 3rd edition. See [Online](#).
- The Wall Street Journal (WSJ): You have access to the Wall Street Journal through [ASU Library Services](#). Articles from WSJ and other practice-oriented journals/popular outlets will be posted in-class/Canvas. You are encouraged to read these articles.

**Description** This course is an advanced course on Operations Management with an emphasis on planning and execution of supply chain operations. We will explore some topics already introduced in the introductory course on Operations and Supply Chain Management (SCM 502) in greater detail, while some other topics are new. We will borrow several tools developed in other courses you may have already taken, e.g., Decision Modeling, Predictive and Prescriptive Analytics, Logistics and Distribution Management, etc.

An important learning from this course arises from a hands-on approach for data-driven decision making with applications to SCM using real data and through simulations. These models can be:

- descriptive (e.g., understanding summary statistics, trends, seasonality, etc.),
- predictive (e.g., using forecasting models introduced in SCM 541),
- prescriptive (e.g., using simulation or optimization methods such as linear programming).

**Learning Objectives** The key learning objectives of this course are:

- Apply quantitative models to problems in Supply Chain Management.
- Learn how to do internal benchmarking of manufacturing and service systems.
- Identify differences and similarities between manufacturing and service systems.
- Use models as part of decision making for facility location, aggregate planning, quality, and scheduling problems.
- Develop *deep analytical thinking* in operations and supply chain practices.

**W.P. Carey Learning Goals** The Full-Time MBA program at the W.P. Carey School of Business has established the following learning goals for its graduate students (Items in bold have significant coverage in this course):

1. **Critical Thinking.**
2. **Communication.**
3. **Discipline-Specific Knowledge.**
4. Ethical Leadership or Global Leadership

## Tentative Course Schedule

The schedule below is tentative. Changes to the schedule will be announced in-class.

Session 1.1 <sup>a</sup>	Administrivia, Beer Distribution Game. Technology Setup, Introduction, Operations, Planning, Forecasting, Decision-Making, Beer Distribution Game (Recall)
Session 1.2	Capacity and Process Analysis Summary of Core Ideas from SCM 502 and SCM 541, Key KPIs in Capacity and Process Analysis, Resource Capacity, Bottleneck, Cycle Time, Flow Time, Throughput
Session 2.1	Operations Strategy: Products vs. Processes Drivers of Productivity in Processes, Measuring Productivity, Total Factor Productivity
Session 2.2	Queueing I (Corrupting) Influence of Variability, Quantifying the Cost of Variability, Queueing, VUT Equation, Serial Queues, Parallel Queues, Pooling Efficiency, Applications.
Session 3.1	Queueing II Simulating Queues, Serial Queues, Parallel Queues
Session 3.2	Inventory Management I Continuous Review Models of Inventory Management ( $Q, r$ )-policies, Safety Stock, Newsvendor Model, Critical Fractile, Periodic Review Models of Inventory Management, Order-up-to-Policies, Base-Stock Policies, ( $s, S$ )-policies
Session 4.1	Inventory Management II Impact of Pooling, Pooling vs. Unpooling of Inventory, Optimal Inventory Decisions under Transshipment
Session 4.2	Dynamic Decision-Making Models Dynamic Programming, Bellman's Principle of Optimality, Backward Induction, Online Decision-Making, Applications to Inventory Management, Scheduling, and Queueing, Heuristics in Decision-Making
Session 5.1	Scheduling I Scheduling Operations, Applications to Manufacturing and Healthcare Operations
Session 5.2	Scheduling II Sequencing and Scheduling, Deterministic vs. Stochastic Scheduling, Problem Solving Session
Session 6.1	Supply Chain Coordination I Contracts, Incentive Misalignment in Supply Chains,
Session 6.2	Supply Chain Coordination II Cheap Talk, Role of Information Sharing, Risk-Sharing
Session 7.1	Recap and Problem Solving Session Problem Solving, Guest Lecture, Buffer, Course Recap
Session 7.2	Exam Exam in-class.
Session 8.1	Project Presentations In-Class Presentation of Course Project

<sup>a</sup>Session  $w.d$  refers to the session on lecture session  $d$  in week  $w$ , where  $d = 1$  (resp., 2) refers to the first (resp., second) meeting session of the week.

**Important Dates** This is tentative and subject to change.

### Homework

Session 2.1 ..... Bullwhip Effect in Supply Chains

Session 3.1 ..... Massachusetts General Hospital

Session 4.1 ..... Innovation at Uber: The Launch of Express POOL

Session 5.1 ..... Paper and More

Session 6.1 ..... Hewlett Packard (A)

### Exam/Project Presentations

Session 7.2 ..... Exam

■ In-class exam.

Session 8.1 ..... Project Presentations

■ In-Class Project Presentation.

**Grading Policy** Six components determine your grade: Exams, Case Homeworks, Case Presentation, Littlefield Simulation, Internship Presentation and Final Project Presentation. The relative weights are as follows:

Exam ..... 30%

■ In-class exam.

Homeworks ..... 30%

■ Five homeworks, each accounting for 6%.

Littlefield Simulation ..... 10%

■ (Relative) Performance on the Littlefield Simulation.

Littlefield Simulation: Report ..... 5%

■ Analysis Report of the Littlefield Simulation.

Project Presentation ..... 25%

■ Course project with a case article.

Grades will be assigned based on a curve fitted to the cumulative final score. The guidelines of the curve are as follows:

- The median score will receive a  $B+$ .
- Anything above that can be an  $A+$ ,  $A$ ,  $A-$ .
- Scores below the median may be  $B+$ , depending on the distribution.

All grades (homeworks or exams) must be contested within a week of posting the grades. Grades not contested within a week are considered *final* and will not be changed.

**Classroom Decorum** To facilitate learning, students are encouraged to attend class on a regular basis.

- Class sessions will focus on active learning methods in which students will be given a chance to explore the topics from the readings more deeply.
- These in class exercises are based on problems drawn directly from industry. As such, class attendance is important as is the need to do the reading before class.
- Please avoid disturbing other students in class.
- There are no extra credit opportunities.
- Late homeworks are not accepted under any circumstances.
- Make-up exams are offered only under special circumstances – If you end up taking a make-up exam, you must take the exam before the scheduled date. Please contact me regarding any special needs, should you take a make-up exam.
- You are obligated to read, understand, and obey the [ASU Student Academic Integrity Policy](#) and the [W. P. Carey student Honor Code](#). Students found to have engaged in any form of academic dishonesty will be subject to sanction.

**Prohibition Against Discrimination, Harassment, and Retaliation** Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited.

An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources here.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. [ASU Counseling Services](#), is available if you wish to discuss any concerns confidentially and privately. ASU online students may access [360 Life Services](#).

**Absence Policies** Attendance in class is *not required, but highly recommended*. Any missed quizzes or assignments will not be made up except in the case of emergency unless documentation is provided. Exceptions to this are described in the Religious Accommodations and University-Sanctioned Activities described below.

**Religious Accommodations** Accommodations will be made for students with religious holidays: [Here](#) is the calendar of official religious holidays. Each holiday noted with two asterisks denotes an observance for which work is not allowed. For these holidays, students will not be penalized in any way for missing class or assignment. This means that this will not count as an absence in class and they will be granted a makeup assignment or exam, etc., as needed.

**University-Sanctioned Activities** Accommodations will be made for students who miss class related to university-sanctioned activities according to ACD 304-02. If you are participating in a university-sanctioned activity, please let me know as early in the course as possible so that accommodations can be made.

**Instructor Absence Policy** In the event the instructor fails to indicate a time obligation, the time obligation will be 15 minutes for class sessions lasting 90 minutes or less, and 30 minutes for class sessions lasting more than 90 minutes. Students may be directed to wait longer by someone from the academic unit if they know the instructor will arrive shortly.

**Threatening Behavior Policy** The university takes threatening behavior very seriously and these situations will be handled in accordance with the Student Services Manual, [SSM 104-02](#).

**Disability Accommodations** If you need an accommodation for a disability, you must register with the Disability Resource Center (DRC).