

# Stevens Institute of Technology - School of Business

## Syllabus

# EMT-657-WS/MGT 657-WS Operations Management

<b>Semester:</b> Fall 2022	<b>Day of Week/Time:</b> Thursday 6:30 PM -9:00 PM <b>Delivery Mode:</b> Online
<b>Instructor Name &amp; Contact Information:</b> <b>Dr. Somayeh Moazeni</b> <b>Associate Professor</b> <b>School of Business</b> <b>Email:</b> <a href="mailto:smoazeni@stevens.edu">smoazeni@stevens.edu</a> <b>Web:</b> <a href="https://smoazeni.github.io/">https://smoazeni.github.io/</a> <b>Tel:</b> (201) 216-8723 <b>Office location:</b> Babbio 519	<b>Office Hours:</b> <b>Mondays 9 AM – 10:30 AM</b> <b>or by appointment</b> <b>Zoom Personal Room for Office Hours:</b> <a href="https://stevens.zoom.us/j/4842775908">https://stevens.zoom.us/j/4842775908</a> <b>Passcode:</b> Babbio519 <b>Course Website:</b> <a href="http://www.stevens.edu/canvas">www.stevens.edu/canvas</a>

## Overview

This course introduces students to the design, analysis, reengineering, optimization and functional control of manufacturing and service operations, and highlights the intense need for effective management of the constrained resources of their constituent systems. The course introduces students to the principal functions of operations management and to the techniques of modern operations management in managing systems and functions that provide goods and/or services. These systems and functions include, among others, forecasting and capacity planning, process management, controlling costs and productivity, supply chain management, inventory management and scheduling. The course discusses the kinds of problems that arise during the design and operation phase, as well as problem-solving methods that can be applied using analytical and computational techniques.

**Prerequisites:** While not required, some basic knowledge of probability statistics and optimization is desirable.

## Introduction to Course

MGT 657 covers the general area of management of manufacturing and service operations. In summary, the course provides:

- (a) an introductory overview of the major areas of operations management,
- (b) a definition of the practical and theoretical problems encountered in operations,
- (c) an analysis of the strategic and tactical approaches for effective management emphasizing both qualitative reflection and quantitative methods.

The topics include the major business processes inherent in the operation systems, e.g., operations strategy – starting from the big picture, product, service and process design, forecasting, planning and scheduling, facility location and layout, production planning, procurement and inventory management, scheduling, and quality control. The course applies qualitative and quantitative techniques such as optimization, statistical quality control, and inventory models to improve decision-making in product and process design, resource allocation, and product quality management.

Additional learning objectives includes the development of:

**Communication Skills:** The course contains several written assignments that provide a formal assessment of students' understanding on various aspects of operations management and operations strategy.

**Technology Role in Business:** The overall coursework aims to equip the students with the ability to utilize the modern analytical techniques and computational methods for managing real life systems that manufacture goods and/or provide services. Readings are also provided to familiarize the students with the ways in which an array of modern companies use ICT technology to address challenging operations management problems.

**Analytical Problem Solving Skills:** Through multiple homework assignments, a mid-term exam and a comprehensive final exam, the students will be required to formulate a wide array of operational management problems and to solve those problems using modern quantitative techniques, such as statistics and probability theory, forecasting methods, queuing theory, optimization and linear programming, simulation and others.

**Global Awareness:** Part of the course studies the structure and operation of global supply chain networks. Furthermore, it explores how operations influences sustainability and how sustainable thinking can influence operations management based on the triple "people-planet-profit".

## Learning Goals and Course Outcomes

After completing the course, students will be able to

1. Understand how the production and operations function is managed and how it interacts with other key business functions
2. Understand core concepts of supply chain management, discuss the goals of a supply chain, explain the impact of supply chain decisions on the success of a company, and identify key decision areas.
3. Comprehend and evaluate the details of capacity planning, facility planning, locating, layout and design
4. Learn and select the tools and analytical techniques used by managers to improve operations and to aid decision-making
5. Incorporate the concepts of quality management into the enterprise's operations
6. Examine and specify various demand forecasting techniques
7. Understand the aspects of production planning and inventory control systems
8. Mine procurement and vendor data, perform spend analysis and make sourcing decisions
9. Develop models for making network design decisions and use optimization methods for facility location and network design decisions

10. Use decision tree methodologies to evaluate supply chain planning and capacity allocation decisions under uncertainty

## Pedagogy

The course will employ lectures, individual assignments, and individual homework and cases.

Students will engage in the following activities:

- Attend and participate in the weekly classes.
- Actively participate in the in-class discussions Read assigned material prior to the indicated class lectures (if required).
- Prepare homework assignments in accordance with predefined guidelines.
- Participate in mid-term and final open book exams.

Students will be responsible for reading lecture material prior to each class; while the actual classroom discussions will reiterate the OM practices, methods and theories, and provide the opportunities for in-class review of homework problems and/or optional application oriented cases. Lecture notes will be provided in advance and are designed to help clarify and emphasize key points covered in the class. There will be homework problems assigned to you for helping you understand the materials covered and preparing you for exams.

Canvas will be used as the primary course management tool. You will be automatically enrolled in Canvas once you register for the course. All relevant class materials and class announcements will be available on Canvas.

## Required Textbook

- Jay Heizer and Barry Render. **Operations Management**. Pearson, 11<sup>th</sup> Edition (2014).
- or
- Jay Heizer, Barry Render, Chuck Munson. **Operations Management: Sustainability and Supply Chain Management**. Pearson, 12<sup>th</sup> edition (2017) or 13<sup>th</sup> edition (2019) or 14<sup>th</sup> edition (2022)
  - Harvard Business Publishing coursepack for a few case studies

## Optional Readings

- F. Robert Jacobs, Richard Chase. **Operations and Supply Chain Management**. McGraw-Hill Education, 16th edition (2020).
- Lawrence V. Snyder, Zuo-Jun Max Shen, **Fundamentals of Supply Chain Theory**, Wiley (2011)
- Lee Krajewski, Manoj Malhotra, Larry Ritzman. **Operations Management: Processes and Supply Chains**. Pearson Prentice Hall, 12<sup>th</sup> Edition (2018).
- Anupindi, Ravi, Sunil Chopra, Sudhakar D. Deshmukh, Jan A. Van Mieghem, Eitan Zeinel. **Managing Business Process Flows**. Pearson, 3rd Edition (2013).
- Gerard Cachon, Christian Terwiesch. **Matching Supply with Demand: An Introduction to Operations Management**. McGraw-Hill, 4th Edition (2018).

- Eliyahu M. Goldratt, Jeff Cox, **The Goal: A Process of Ongoing Improvement**. North River Press, 30th Anniversary edition (2014).

## Course Components

The course will emphasize the various aspects of Operations Management listed in the syllabus.

**Class Participation** - To enhance the learning experience, all students are expected to participate in class discussions. Preparation of materials assigned for each class before the session is important since exams will be based mostly on the class lectures and in-class discussions. You are expected to listen to the recorded lectures, review the lecture slides and materials.

**Homework** – Graded homework will be submitted via Canvas. Late homework submissions will be subject to a 15% deduction.

**Midterm and Final Exams** - There will be a midterm exam scheduled during regular class time and a final examination. Exams consist mostly of answering short problems and multiple-choice questions. The exams will focus on the materials that are discussed in the class sessions.

**Case Studies:** This is a team project. You need to complete case studies and present in specified lectures.

The scale for grades is:

A >92; A- 92~90; B+ 89~85; B 84~80; B- 79~75; C+ 74~70; C 69~65; C- 64~60; F<60

## Grading Procedure

Assignment	Grade Percent
Class Participation	5%
Homework	45%
Case studies	5%
Mid-Term Exam	25%
Final Exam	20%
<b>Total Grade</b>	<b>100%</b>

## Ethical Conduct

The following statement is printed in the Stevens Graduate Catalog and applies to all students taking Stevens courses, on and off campus.

“Cheating during in-class tests or take-home examinations or homework is, of course, illegal and immoral. A Graduate Academic Evaluation Board exists to investigate academic improprieties, conduct hearings, and determine any necessary actions. The term ‘academic impropriety’ is meant to include, but is not limited to, cheating on homework, during in-class or take home examinations and plagiarism.” *Reference: The Graduate Student Handbook*

Please note that assignments in this class may be submitted to [www.turnitin.com](http://www.turnitin.com), a web-based anti-plagiarism system, for an evaluation of their originality.

## Course Schedule

Week	Subjects	Reading Material / Homework Assignments / Exams
1	Operations and Productivity	Chapter 1 and Part of Chapter 2
2	Product and Service Design	Chapter 5
3	Quality Management and Quality Control	Chapter 6 and Supplement 6
4	Process Strategy	Chapter 7
5	Capacity and Constraint Management	Supplement 7 and Lecture Material
6	Location Strategies	Chapter 8 and Modules B and C
7	Layout Strategies	Chapter 9 and Module D
8	<b>Mid-Term Exam</b>	
9	Inventory Models and Management I	Chapter 12 and Course Notes
10	Inventory Models and Management I	
11	Aggregate Planning, Master Scheduling, Material Requirements Planning	Parts of Chapters 13 and 14
12	Short-Term Scheduling	Chapter 15
13	Lean Operations	Chapter 16
14	Supply Chain and Risk Management	Chapter 11 and Supplement 11 and Lecture Material
15	<b>Final Exam</b>	