

Sustainable Operations Management

Title of the course: Sustainable Operations Management

Analysis Instructor: Wenzheng MAO

Course code:

Teaching Language: English

Targeted students: Master

Contact Hours: 36

Self-learning Hours: 72

Prerequisites: Introduction to operations management

Number of learners: Less than 55

Academic Year:

Credits: 3

Profile of Teaching Staff

Wenzheng MAO

Wenzheng Mao is an Associate Professor of Management Science and Engineering in the School of Economics and Management at Tongji University. She received her Ph.D. degree in management and strategy from the University of Hong Kong. Dr. Mao's research interests focus on supply chain management, empirical operations management and industrial organization, and she is interested in using cross-disciplined research methods to analyze practical problems in business.

1. Course Description

Business decision-making involves considerable complexity and uncertainty. This course, Sustainable Operations Management, introduces students to the fundamental concepts of quantitative analysis to help them gain a clear understanding of the key elements in a business process. The course will provide an extensive discussion on methods that are widely used in business organizations to address a variety of operational challenges.

Students will learn tools and techniques that enhance their ability to approach, analyze, and solve problems of various scales within the realm of sustainable operations.

Emphasizing sustainability, the course integrates principles that consider environmental, social, and economic impacts as part of the problem-solving process. This holistic approach aims to improve decision-makers' overall problem-solving abilities.

2. Course Objectives

- Introduction to sustainability and its importance in operations management.
- Quantitative analysis techniques and their applications in sustainability.
- Exploring a richer set of solution alternatives.
- Diverse performance metrics including ecological footprint, social responsibility, and economic viability.

By the end of this course, students will be equipped with the skills to:

- Analyze complex business processes with a focus on sustainability.
- Apply quantitative methods to enhance decision-making.
- Address operational challenges considering a comprehensive set of performance measures.

3. Course Requirements and Assessment

Assessment	Ratio	Requirements
Individual Report	30%	Individual report will be assigned and the due time will be announced at the class.
Group project	20%	One group project will be assigned and you will have around two-week preparation for presentation. You will complete it in self-selected groups of three to four people. Collaboration is key to learning and doing well

		on this project. Group members can evaluate each other's performance by providing comments on the peer evaluation form. Those who under-contribute may be penalized (up to 100% grade deduction).
Assignments	20%	Two assignments will be assigned and answers will be given after the due time. The assignments include calculations questions that reinforce your skills, as well as a case that help your understanding of the idea. We will discuss the cases in the next class after you submit the assignment. Each assignment accounts for 10%.
Class participation	30%	10%: attendance 10%: active participation 10%: in-class game performance

***Individual Report:**

This essay should involve a specific application of the class concepts to solve (or at least analyze) a business problem. First, find a process that you are interested. Second, clearly identify the problem about the process. Third, investigate potential solutions using the class concepts. You are encouraged to directly collect the data and use the data in your analysis. If direct data collection is not available, then specify what kind of data do you need, and you can find aggregate data to approximate the parameters needed for providing potential solutions. Finally, discuss how you are going to implement your potential solutions.

You are encouraged to follow the report outline when you submit your report:

1. Define the process: Supply, demand, the goal, bottlenecks, etc.
2. Identify the difficulties and provide suggestions: Select two to three reasons causing mismatching, and provide "feasible" operations strategies to improve the process.
3. Implement the suggestions: Every suggestion comes with pros and cons. Remember to discuss the financial, operational, and relationship-related impacts, and propose how to implement your suggestions to mitigate the negative impacts.

The report must not exceed 10 single-sided pages including all materials, with margin size of 2.54 cm (for top, bottom, left, and right margins), 12-point Times New Roman font, 1.5-line spacing.

4. Course Arrangement

Course Name		Sustainable Operations Management	Contact Hours	36
Unit	Credit hours	Contents	Assignments	
1	3	Introduction to Sustainable Operations Management Operations strategy and the process view of sustainable operations		
2	4	Forecasting Model 1. Basic probability & statistics 2. Forecasting models 3. In-class practice game	Individual Assignment 1	
3	20	Operations Measure and Decision Models 1. Process analysis and capacity planning: little's law 2. Impact of variability and safety capacity: queueing model 3. Decision models with ESG measures 4. Linear programming 5. In-class practice game 6. Supply chain management and ESG	Individual Assignment 2	
4	9	Process Improvement 1. Quality management and statistical process control 2. Group project and presentation	Group Project and Presentation	

4. Textbook and References

Textbook:

- Anupindi, R., S. Chopra, S. D. Deshmukh, J. A. Van Mieghem, and E. Zemel, *Managing Business Process Flow*, (3rd Edition, Pearson New International Edition)

Supplementary materials:

- Krajewski, L. J., Malhotra, M. K., Ritzman, L. P., Malhotra, M. K., & Ritzman, L. P., *Operations management: Processes and supply chains*. (12th Edition, Pearson New International Edition)
- “*Introduction to the Theory and Practice of Yield Management*,” by Netessine and Shumsky, *INFORMS Transactions on Education*, 3(1), 2002, pp. 34-44.