Course Syllabus of ISOM 2700 Operations Management (L1, L2, and L3)

Fall 2023

COURSE OVERVIEW	Operations management is about designing, analyzing, and improving the whole transformation process, including procurement, production, distribution, warehousing, and retailing, with the objective of creating competitive advantage for the enterprise. ISOM 2700 is designated as a face-to-face learning course and you are expected to review the learning materials on Canvas before attending the student-centered instructor-led session every week.
CLASS SCHEDULE	(L1) Monday and Wednesday, 10:30 AM – 11:50 AM, LSK G012 (L2) Monday and Wednesday, 09:00 AM – 10:20 AM, LSK G012 (L3) Monday and Wednesday, 12:00 PM – 13:20 PM, LSK G012
INSTRUCTOR	Prof. Guodong Lyu (吕国棟) Office hours: o Monday 3 p.m. – 4 p.m. (L1) o Monday 4 p.m. – 5 p.m. (L2) o Monday 5 p.m. – 6 p.m. (L3) o *Additional office hours to be announced before exams* o By Email Appointment [ISOM 2700: QUESTION], LSK 4035 Email: imlyu@ust.hk
TEACHING ASSISTANT	Ms. Stacy Deng Office hours: o Mondays 3:00 p.m. – 4:00 p.m. o By Email Appointment [ISOM 2700: QUESTION], LSK 4065 Email: imsdeng@ust.hk
TEXTBOOKS (optional)	Cachon and Terwiesch, "Matching Supply with Demand", 4th Edition, International Edition, McGraw-Hill. Jacobs and Chase, "Operations and Supply Chain Management: The Core", 6th Edition, International Edition, McGraw-Hill.
GRADING SCHEME	Final course grade will be determined by the following criteria: Homework 10% Midterm Exam 40% Final Exam 50% **Total** **100%**

	Note:
	(1) **Homework:** There will be a total of **4** individual homework assignments in total. You will have 7 days to submit the homework solution after the assignment is published. Please note that late submissions will incur a grade deduction.
	(2) **Exam:** The midterm covers only first half of the course while the final exam covers only the second half. Each exam lasts 2 hours. Both exams are closed book and closed notes. You can bring an A4-size, 2-page cheat sheet, but the cheat sheet is required to submit after the exam.
	No makeup will be given for the midterm exam. If you miss the midterm exam for a valid reason that is approved by the instructor, you will have to take a 3-hour comprehensive final exam instead. More information will be available in due course.
	(3) **Re-grading Policy:** The process of assigning grades is intended to be one of unbiased evaluation. Students are encouraged to respect the integrity and authority of the professor's grading system and are discouraged from pursuing arbitrary challenges to it. If you believe an inadvertent error has been made in the grading of individual assignments or exams, a request to have the grade reevaluated may be submitted. In the event that you would like to request a re-grade:
	o Email the TA and me within **3 days** of receiving your grade, including a brief written statement of why you believe that an error in grading has been made. Late requests will not be entertained.
	o We will re-grade your examination **in its entirety**. That is, we will re-grade all the items in your examination.
ACADEMIC INTEGRITY	Students at HKUST are expected to observe the Academic Honor Code at all times (see *https://registry.hkust.edu.hk/resource-library/academic-honor-code-and-academic-integrity*). Zero tolerance is shown to those who are caught cheating on any homework or exam. In addition to receiving a zero mark on the quiz or exam involved, the final course grade will appear on your record with an X. This X grade will stay with your record until graduation. If you receive another X grade, you will be dismissed from HKUST.
INTENDED LEARNING OBJECTIVE	This course is designed to provide a foundation for understanding the operations of a firm in the big data era. Our objective by the end of the course is to provide you with the analytical skills and managerial insights necessary to critically analyze a firm's operations decisions and practices. Such knowledge is important for careers in a variety of areas, including general management, entrepreneurship, investment banking, business analytics, venture capital and consulting.

	Unlike many courses in the core, which tend to treat the firm as a "black box", we will be primarily concerned with "opening up" the black box and discovering what makes a firm "tick" --- or, for that matter, "stop ticking". To be more concrete, we will focus on how the "physics" of material, work and information flows, and the design and management of a firm's processes interact to determine a firm's cost structure and its ability to compete effectively in terms of non-cost measures such as quality, variety, and speed. After completing the course, you are expected to be able to: 1) Describe the design and delivery of product/service in different organizations, and evaluate the systems for measurement and improvement of operations. 2) Identify and describe operations management as one of the core business functions. 3) Integrate operations management with other business functions to support a coherent corporate strategy and articulate contributions to the well-being of an organization. 4) Determine how operation management decisions impact other business functions. 5) Identify a wide range of contemporary and pervasive global business issues, as well as cultural and technology advancement that impact the management of operations. 6) Apply a range of appropriate quantitative and qualitative methods and tools to solve business problems in which the management of operations is a critical issue. 7) Discuss the role of operations management in sustainability and social responsibility.
TEACHING APPROACH	The general teaching approach is student-centered, instructor-led, face-to-face lecturing, case discussions, as well as problem solving in the classroom. Lecture notes, additional reading articles, and learning resources are posted on Canvas. For many topics, we will start with an example (which can be a real business problem or a simplified version) with concrete numbers and clearly defined questions that are often of managerial relevance. Then we provide rigorous analysis or using Excel spreadsheet to solve the problem and discuss managerial insights based on the analysis.
ATTENDANCE & CLASSROOM ETIQUETTE	Your attendance is expected for every class session. Please notify the professor in advance if you have to miss a class due to a legitimate reason. When you attend, you will be expected to conduct yourself professionally and respectfully during class, which means being attentive and considerate of others in the class. This means refraining from the use of cell phones, text messaging, email, reading the newspaper, etc. during class. Please refrain from generating loud noise in the classroom.

COURSE OUTLINE

This course has the following seven modules, including process analysis, quality management, capacity management, service system, inventory management, revenue management, and supply chain management. The first four modules are covered by the first half of this course while the second half covers the remaining modules. Each module consists of several topics that are connected to some extent and share the common theme of the module.

Figure 1: Course Roadmap

The course is scheduled as follows:

Session	Date	Topic
1	Week 1 4 September (Mon)	**Introduction to Operations Management** *(Please bring your laptop to class)*
2	Week 1 6 September (Wed)	**Process analysis** ■ Little's Law and flow time analysis
3	Week 2 11 September (Mon)	**Flow rate and process capacity** ■ Bottleneck and throughput improvement
4	Week 2 13 September (Wed)	**Monitoring a process using control charts** ■ Natural variation and assignable variation ■ Process control charts

5	Week 3 18 September (Mon)	**Quality management** ■ Acceptance sampling plan ■ Statistical process control ■ Process capability and six sigma quality
6	Week 3 20 September (Wed)	**Capacity planning and decision making tools (I)** ■ Decision tree method
7	Week 4 25 September (Mon)	**Capacity planning and decision making tools (II)** ■ Linear programming method
8	Week 4 27 September (Wed)	**Solving optimization model using Excel** ■ Problem formulation ■ Excel solver *(Please bring your laptop to class)*
	Week 5 2 October (Mon)	*Public Holiday*
9	Week 5 4 October (Wed)	**Coping with variability of service systems** ■ Psychology of waiting ■ Introduction to queueing model
10	Week 6 9 October (Mon)	**Queueing model** ■ Waiting line models and simulation ■ Queue configuration problems
11	Week 6 11 October (Wed)	**Mid-term review** ■ Cover session 2 – session 10
	Week 7 16 October (Mon)	**Extensive consulting for mid-term exam** *(No class)*
Week 7: Mid-term exam, October 17 (LTL & LTG), 6:30-8:30pm	
12	Week 7 18 October (Wed)	**Spreadsheet tutorial** ■ Generating random numbers ■ Simulating Service Systems *(Please bring your laptop to class)*
	Week 8 23 October (Mon)	*Public Holiday*

13	Week 8 25 October (Mon)	**Inventory Management** ■ Purpose of holding inventory ■ Newsvendor model
14	Week 9 30 October (Mon)	**EOQ model** ■ Optimal order quantity
15	Week 9 1 November (Wed)	**Variants of EOQ model** ■ Impact of lead time ■ Impact of demand uncertainty
16	Week 10 6 November (Mon)	**Demand Management and Forecasting** ■ Qualitative forecasting methods
17	Week 10 8 November (Wed)	**Capacity-based Revenue Management** ■ Revenue management with capacity controls ■ Overbooking, protection level, and dynamic pricing
18	Week 11 13 November (Mon)	**Price-based Revenue Management** ■ Willingness to pay and consumer choice ■ Dynamic pricing
19	Week 11 15 November (Wed)	**Managing Supply Chain** ■ Introduction to supply chain management
20	Week 12 20 November (Mon)	**Coordinating Supply Chain** ■ Operational risk and financial risk ■ Hedging operational risk via contracts
21	Week 12 22 November (Wed)	**Bullwhip Effect and Supply Chain Strategies** ■ Bear game and Bullwhip effect ■ Alleviate bullwhip effect
22	Week 13 27 November (Mon)	**Matching in Supply Chain Management** ■ Two-sided supply chain network ■ Stable Matching
23	Week 13 29 November (Wed)	**Final review** ■ Cover session 13 – session 22

Final exam (2 hours, except for those who need to take the comprehensive exam for 3 hours)