

## ISOM 2700 Operations Management Fall 2021

### CLASS SCHEDULE

**Section L3:** Tuesday and Thursday, 3:00pm – 4:20pm, Rm4619

**Section L4:** Tuesday and Thursday, 1:30pm – 2:50pm, Rm4619

**Section L5:** Tuesday and Thursday, 4:30pm – 5:50pm, Rm4619

### INSTRUCTOR

**Prof. Lijian Lu**

Office: LSK 4045

Office hours: Wed. 5 pm – 6 pm and by appointment

Email: [lijianlu@ust.hk](mailto:lijianlu@ust.hk)

### TEACHING ASSISTANT

**Ms. Jing Jia**

Office: LSK 4065

Office hours: Mon. 3 pm – 4 pm or by appointment

Email: [imjing@ust.hk](mailto:imjing@ust.hk)

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### COURSE OVERVIEW & OBJECTIVE

Operations is one of the primary functions of a firm, concerned with the transformation of inputs (e.g., raw material, labor, capital, and information) into outputs (goods or services). Whereas marketing focuses on the demand for the product, finance provides the capital for the product, and operations produces and delivers the product, including procurement, production, distribution, warehousing, and retailing, with the objective of creating competitive advantage for the enterprise.

This course provides a foundation for understanding the operations of a firm. We concentrate on a small number of powerful themes that have emerged recently as the central building blocks of world-class operations. We also present a sample of operations management tools and techniques that have been proved extremely useful over the years. 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 (e.g. business restructurings, mergers and acquisitions), venture capital (e.g. evaluating new business plans) and management consulting (business restructuring improvement).

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". In contrast to your management courses, our focus is on the technological rather than human dimension of a firm's internal operations - though there are obvious connections between the two that we will explore. In contrast to the measurement focus of your accounting courses, our concern is to understand what elements of a firm's operations enable it to produce quality outputs at a competitive cost structure. That is, 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.

### **TEXTBOOKS** (optional)

1. Cachon and Terwiesch, "Matching Supply with Demand", 4th Edition, International Edition, McGraw-Hill.
2. Jacobs and Chase, "Operations and Supply Chain Management: The Core", 4th Edition, International Edition, McGraw-Hill.

### **GRADING POLICY**

Online quizzes (5+1)	20%
Midterm Exam	40%
Final Exam	40%
<b>Total</b>	<b>100%</b>

- 1) **5+1 Quizzes:** For week 4 to week 13 only.
  - Each online quiz consists of 10 questions.
  - Once you start the quiz, the timer will start automatically and you must complete it within the time limit.

- The quiz for the week will be released on Monday. You must complete the quiz by the due time (**23:59 on Saturday**) each week.
  - No makeup quiz will be given. The quiz for the week will be waived only if you have a valid reason, such as medical emergency.
  - The quiz with the lowest grade will be dropped, i.e., your quiz's grade will be based on 5 quizzes.
- 2) **Exam:** Midterm and final exam consists of 50 multiple choice questions and lasts 2 hours each. No makeup exam for the midterm exam will be given. If you miss the midterm exam for a valid and verifiable reason approved by the instructor in advance, you will have to take a 3-hour, 80-question cumulative final exam (covering entire course) and the weight of the mid-term will be added to the final exam. Otherwise, a zero mark will be assigned as your mid-term grade.
- Both exams are close-note and close-book, more information will be available in due course.
- 3) Practice problems will be provided throughout the course to help students improve their understanding of course material. The practice problems are not counted toward the final grade, so there is no need to submit solutions to the practice problems, although it is highly encouraged to solve the problems individually.

### **ACADEMIC INTEGRITY**

Students at HKUST are expected to observe the Academic Honor Code at all times (see <http://rpghandbook.ust.hk/student-conduct-and-academic-integrity#honor> for more information). Zero tolerance is shown to those who are caught cheating on exam. In addition to receiving a zero mark on the exam involved, the final course grade will appear on your record with an X, to show that the grade resulted from cheating. This X grade will stay with your record until graduation. If you receive another X grade, you will be dismissed from HKUST.

### **TEACHING APPROACH**

The general teaching approach is lecturing, case discussions, as well as problem solving and demonstrations 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 Excel spreadsheet analysis to solve the problem and discuss managerial insights based on the analysis.

## **COURSE OUTLINE**

This course has the following four modules, each of which consists of several topics that are connected to some extent and share the common theme of the module.

### **1) Managing Process and Resource**

- Process analysis and its applications;
- Quality management;
- Resource management.

### **2) Managing Service System**

- Coping with variability of service system;
- Separating vs. pooling servers;
- Queuing models;
- Simulating service system.

**Midterm Exam Time and Venue: TBD**

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### **3) Matching Supply with Demand**

- Economic order quantity (EOQ) model;
- Newsvendor model;
- Demand forecasting and revenue management.

### **4) Managing Supply Chain**

- Value of flexibility and postponement;
- Information distortion: Bullwhip effect;
- Supply chain coordination via contract.

**ISOM 2700 Operations Management**

## Prof. Lijian Lu, Fall 2021 Course at A Glance

#	Date	Module	Topics	Notes
1	Sep 2		- Introduction to Operation Management	
2	Sep 7	Process Analysis	- Fundamentals of Process Analysis <ul style="list-style-type: none"> <li>o Process Analysis</li> <li>o Bottleneck Analysis</li> <li>o Little's Law</li> </ul>	
3	Sep 9		- Applications: The Goal	
4	Sep 14	Quality Management	- Statistical Process Control	
5	Sep 16		- Six Sigma	
6	Sep 21	Resource Management	- Decision Tree Method	
7	Sep 23		- Resource Allocation via Linear Programming	
8	Sep 28		- LP Excel Solver	Laptop in Class
9	Sep 30	Service Ops Management	- Coping with Variability of Service Systems	
10	Oct 5		- Queue Model (M/M/s)	
11	Oct 7		- Queue Models - Value of Pooling	
	Oct 12	Midterm Exam	- Simulating Service Systems	Laptop in Class
	Oct 19		<b>Midterm Exam Review Session</b>	
			<b>Midterm Exam</b> (Date and Time: TBD)	
12	Oct 21		- Demand Forecasting	
13	Oct 26	Inventory Management	- Inventory Management: Economic Order Quantity (EOQ)	
14	Oct 28		- Inventory Management: Newsvendor Model	
15	Nov 2		- More on Inventory Management	
16	Nov 4	Revenue Management	- Revenue Management: Capacity-based Model	

17	Nov 9		- Revenue Management: Price-based Model	
18	Nov 11	Supply Chain Management	- Intro to Supply Chain Management	
19	Nov 16		- Flexibility and postponement	
20	Nov 18		- Bullwhip effects	
21	Nov 23		- Supply Chain Coordination via Contracts	Laptop in class
22	Nov 25	Best OM Practice	- Best OM Practice: <ul style="list-style-type: none"> <li>o Sales and Operations Planning</li> <li>o Flexible vs dedicated</li> <li>o Matching</li> </ul>	Laptop in class
	<b>Nov 30</b>		<b>Final Exam Review Session</b>	
	<b>TBD</b>		<b>Final Exam</b>	

#	Due Date
Quiz 1	Sep 25 (23:59pm)
Quiz 2	Oct 02 (23:59pm)
Quiz 3	Oct 09 (23:59pm)
Quiz 4	Nov 06 (23:59pm)
Quiz 5	Nov 20 (23:59pm)
Quiz 6	Dec 04 (23:59pm)

**Note: The instructor reserves the right to modify the course outline during the term when needed.**