

# ISOM 2700 Sections L5-L7 Fall 2024 Syllabus

**COURSE:** ISOM2700 Operations Management (3-0-0:3)

Production and service operations viewed from the strategic, tactical and operational levels: capacity planning, process selection, impact of technology, location and layout, material and resource requirements, scheduling and quality control. Exclusion: ISOM2720 and IELM4100

Mondays and Fridays:

L6: 1:30-2:50PM

L5: 4-4:20PM

L7: 4:30-5:50PM

**INSTRUCTOR:** Prof. Suri Gurumurthi ([imsuri@ust.hk](mailto:imsuri@ust.hk))

Office: LSK 4016A; Phone: 34692554

Office hours: M-F 12PM-1:30PM

**TEACHING ASSISTANTS:** Ms. Stacy Deng and

Miss Sherry Wu ([imwuc@ust.hk](mailto:imwuc@ust.hk))

Office: LSK-4065; Phone: 2358-8746; Office hours: By Appointment.

**TEXTS:** Learning materials (slides and associated discussion) are available on Canvas

**GRADING POLICY:** Final course grade will be determined by the following criteria and maximum point distribution:

Participation and Quizzes	20
Midterm exam	35
Final exam	<u>45</u>
Total	100

## **PARTICIPATION:**

- You can earn an average of 1- 2 points per week for a variety of learning activities, including in-class discussion and in-class quizzes. Attendance and in class surveys or other activities will be recorded only on Tuesday classes, and not on Thursday classes. But I encourage attendance when class is in session always.

**EXAM:** The midterm covers only part A of the course while the final exam covers only part B. No makeup will be given for the midterm exam as such; if you miss the midterm exam for a valid reason that is pre-approved by the instructor, you will have to take a 3-hour, 80-question comprehensive final exam instead. All exams are closed book, closed notes but a table of formulae will be provided with the exam. The exam will be conducted in-person.

**COURSE GRADE:** In determining the final course grade, your instructor will consider the **DISTRIBUTION:** following grade distribution measured in points achieved overall.

- A 90-100
- B 80-90
- C 70-80
- D 60-70
- F 60 and below

**LEARNING OUTCOMES:** This course is designed in such a way that, after completing it, you will 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. [1,4]
2. Identify and select crucial variables and measurements in decision modeling. [1]
3. Identify and describe operations management as one of the core business functions. [3]
4. Integrate operations management with other business functions to support a coherent corporate strategy. [3]
5. Determine how operation management decisions impact other business functions. [3]

6. Identify a wide range of contemporary and pervasive global business issues, as well as cultural and technology advancement that impact the management of operations. [4, 6]
7. 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. [4,7]
8. Discuss the role of operations management in sustainability and social responsibility. [8]

The numbers at the end of each learning goal correspond to those learning goals and objectives for the BBA-OM Program. For details, please visit the BBA-OM web site at <http://bbaom.ust.hk/inquiry> .

**PEDAGOGY:** Most lectures and solved problems are posted on canvas for your advance reading. Additional reading materials and other learning resources such as external videos are also posted on Canvas. Students are expected to complete all reading activities online for each week before attending class. Students are encouraged to ask questions during the instructor-led, face-to-face class meetings.

**ACADEMIC INTEGRITY:** Students at HKUST are expected to observe the Academic Honor Code at all times: <http://ugadmin.ust.hk/integrity/>

Zero tolerance is shown to those who are caught cheating on any form of assessment and a zero mark will be given. Any act of cheating on exam will automatically result in a XF grade for this course. This XF grade will stay with your record until graduation. If you receive another XF or X grade, you will be dismissed from the University. All written assignments will be screened by Turnitin for plagiarism and points will be deducted when the similarity index is considered high (e.g., more than 25%).

## Part A: Managing Business Process Flow

### Operations Strategy

#### Module 1

September 2, 6

- What is Operations Management?
- Elements of Operations Strategy
- Objectives for Operations Management
- Operational Performance Measures
- Order Winning vs Order Qualifying Measures
- **Module 1 Quiz due Sept 8<sup>th</sup>**

### Process Selection and Product Design

#### Module 2

September 9, 13

- Different Process Types and Uses
- Product Design Activities
- New Product Development Strategy
- Process Modularity and Design
- Service Operations and Service Strategy
- Service Profit Chain
- **Module 2 Quiz Due Sept 15<sup>th</sup>**

### Setting up Capacity and Related Optimization decisions

#### Module 3

September 16, 20

- Capacity dimensions and Bottlenecks
- Capacity Breakeven Analysis
- Decision tree method and value of perfect information
- Linear programming technique
- Product mix optimization problems
- **Module 3 quiz due Sept 22<sup>nd</sup>**

## Process Flow Measures

### Module 4,5

September 23, 27

- Defining capacity in terms of flow
- Batch versus unit processing examples
- Economies of scale in processes
- Cycle Time of a process
- **Module 5 Spreadsheet Exercise Due Sept 29<sup>th</sup>**

## Process Flow and Bottleneck Analysis

### Module 5

Sept 30, Oct 4

- Little's Law
- Bottleneck management
- Impact of product mix on capacity
- Project Lead Times
- **Module 5B Quiz Due Oct 6<sup>th</sup>**

## Managing waiting lines and Process Delays

### Module 5 and 6

Oct 7, 14, 18

- Psychology of waiting
- Waiting line models and simulation
- Queue configuration problems
- **Module 6 Spreadsheet Exercise Due Oct 13<sup>th</sup>**

**Oct 23<sup>rd</sup> (Location and Time TBA): Mid-term exam (for part A only, 40-45 questions, 1 hour and 45 minutes).**

**Exam will be administered in person. Please wait for confirmation of the exam date and venue. This date has been requested for now.**

**No make-up offered, and in case of documented health issues the weight can be shifted to a comprehensive final exam that will cover both Part A and B.**

## Part B: Matching Supply and Demand

### Demand management and forecasting

#### Module 7

Oct 28, Nov 1

- Qualitative and quantitative approaches
- Basic time series forecasting models
- Forecasting errors
- **Module 7 Spreadsheet Exercise due Oct 27<sup>th</sup>**

### Inventory management

#### Module 8

Nov 4, 8

- Inventory classification and management needs
- Basic inventory models: Order quantity and reorder point
- Safety stock and service levels
- **Module 8A Spreadsheet Due Nov 3<sup>rd</sup>**

### Managing supply for short life cycle products with uncertain demand

#### Module 8 (contd.)

Nov 11, 15

- The newsvendor problem
- Revenue management with capacity controls
- Capacity Reservation, protection levels
- **Module 8B Spreadsheet Due Nov 10<sup>th</sup>**

### Managing Quality

#### Module 9 and 10

Nov 18, 22

- Quality management
- Garvin's Dimensions of Product Quality
- The Gap Model of Service Quality
- Acceptance sampling plan
- Statistical process control
- Process capability and six sigma quality
- **Module 10 Spreadsheet Exercise Due Nov 17<sup>th</sup>**

## Supply chain management and Lean Operations

### Module 11

Nov 25, 29

- Supply Chain Structure and Behavior
- Supply Chain Coordination
- Revenue management in supply chains
- Major elements of just-in-time and Kanban systems
- Sustainability Case Examples
- **Module 11 Supply Chain Revenue Management Spreadsheet Due Nov 24<sup>th</sup>**

### Review and Buffer Time

Nov 28 and Nov 30

- Any pending materials from previous weeks
- **Final Exam Review** (Pre-recorded Discussion) during last week of classes

*Final exam (for Modules 6-11 only), 50 questions, 2 hours, except for those who need to take the 80-question comprehensive exam for 3 hours)*