The Hong Kong University of Science and Technology

1. General Information

- **Course number:** ISOM 4760
- **Course Title:** Operations Strategy for Technology Value Chains
- **No. of Credits:** 3
- **Pre-requisite:** ISOM 2700 Operations Management
- **Name of Instructor:** Prof. Suri Gurumurthi, imsuri@ust.hk
- Office: LSK 5016B; Office Hours W-F 1:3PM
- TA: Vaishnavi Navalgund, imvaish@ust.hk

2. Course Description

Operations strategy is a critical advantage for most technology companies for two reasons. One being that technology companies need to scale to offer their services to potentially billions of users across the world, and second, they need to innovate constantly while maintaining the quality of their products and services. These very specific requirements on technology firms impose special challenges on their operational infrastructure and processes. We will identify best practices and demonstrate and develop strategic and tactical management frameworks that can help technology firms navigate these challenges to optimize customer satisfaction, cost, and revenue metrics. This course is designed for students who are interested in operations management, strategy, and technology management/consulting careers.

3. Intended Learning Outcomes (ILOs)

At the end of the course, students should be able to demonstrate competence in the following areas:

- Explain the role of operations strategy in technology firms and its connection to innovation, scalability, and competitive advantage.
- Analyze the trade-offs between efficiency, quality, speed, and flexibility in high-growth technology environments.
- Apply frameworks for capacity planning, process design, and technology adoption to address scaling challenges.
- Assess global operational strategies for technology firms, including offshoring, localization. Evaluate best practices in agile operations, lean startup methods, and continuous deployment to support innovation with reliability.
- Design operational processes and recommend improvements that balance growth, innovation, and quality.

- Use quantitative and qualitative tools to assess performance and optimize cost, quality, and customer satisfaction.
- Assess global, ethical, and sustainability considerations in technology operations and service delivery.
- Develop and communicate consulting-style recommendations for operational strategy, synthesizing insights from cases and data analysis.

4. **Grading policy**

Methods of assessment include: case analysis and presentation, research papers, project-based assignments, discussions, examinations.

Assessment Task	**Contribution to Overall Course grade (%)**
Two Written Assignments	20 %
Midterm Exam (Open notes)	30%
Final examination (Open notes)	40%
Class Participation	10 %

5. **Final Grade Descriptors**

This course will be assessed using criterion-referencing and grades will not be assigned using a curve.

Grade:

A: 90-100 percent

B: 80-90 percent

C: 70-80 percent

D: 60-70 percent

F: 60 percent and below

Grade	Description
A	Excellent performance: Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good performance: Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory performance: Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal pass: Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.
F	Fail: Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.

6. **Outline and Suggested Schedule**

Module 1: The Product Perspective

Four Perspectives of Global Supply Chains

Case: Boeing 787 Dreamliner and the Product Perspective

Relationship between Product Architecture and Supply Chain Structure

Module 2: The Product Perspective

Managing Technologically Complex Innovation Projects

Case: Boeing 737 Max Crisis and the Product Perspective

Managing Operational and Project Risks in Complex Innovation Efforts

Module 3: The Value Chain Perspective

Operations and Business Strategy for Technology Leadership;

Case: Huawei Consumer Business and the Value Chain Perspective

Diagonal Diversification for Technology Leadership

Risks from Diagonal Diversification

Module 4: The Process Perspective

Digital Transformation of Retail Operations

Case: Amazon vs WalMart and the Process Perspective

Leveraging Technology for Economies of Scope

Module 5: The Process Perspective

Industry 4.0, the Fourth Industrial Revolution

Coats Industrial Threads: From Industry 1.0 to Industry 4.0

Hybrid Fulfillment Strategies for Fast Fashion using Responsive Technologies

Module 6: The Process and Business Relationship Perspectives

Lenovo Computers: Digital Transformation and Supply Chain Intelligence

Frameworks for Digital Transformation of Supply Chain Processes

Module 7: Intersection of Sustainability and Technology

The Economics of Sustainability

Esquel Shirts: Sustainable Technologies for Value Innovation

Module 8: The Business Relationship and Value Chain Perspectives

Operations in the Peer-to-Peer and App Economy

Uber: Reinventing the Business Model with Digital Transformation;

Revenue Sharing Models for the Peer-to-Peer and App Economy

Module 9: Business Relationship and Value Chain Perspectives

Core Operations Competencies in the emerging AI Landscape

NVIDIA: The Smiling Curve of Value

Leveraging Complementary Technologies for Maximizing Customer Lock-In

Module 10: Business Relationships in the Content Economy

Infrastructure as a Service: Amazon Web Services

Platform as a Service

Software as a Service

Module 11: Operations in the Generative AI Economy

Data Center Development and Management

Autonomous Agents and the Token Economy

7. **Methods of Instruction and Assessment**
8. a) Instructors should use appropriate instruction methods that are consistent with the level of instruction and the course description stated in Section II,. Examples of instruction methods for the course include:

- Class lecture/examples/discussion
- Individual and team case analysis
- Written assignments including research papers

- Guest speakers from technology companies
- Quantitative models and demonstration of business analytics for critical decisions

1. b) Required materials for study will include

- Cases published through Thompson Case Center and authored by the instructor
- Industry articles and operations strategy white papers by leading companies in technology
- Appropriate cases from Harvard Business Publishing or Ivey Publishing focusing on technology companies.

There will be no required textbooks, but students can use reference books for some background study and understanding of operations strategy concepts:

Operations Strategy, by Jan Van Mieghem, 2015.

Operations, Strategy, and Technology: Pursuing the Competitive Edge, by Robert Hayes, Gary Pisano, David Upton, and Steven Wheelwright, 1984

1. c) There will be written assignments in the form of case reports that will test students' understanding of core concepts in technology value chains and operations strategy.
2. d) Students will also present on the operational challenges of a technology company of their choosing and discuss relevant issues and possible recommendations to remedy said issues in a presentation to the class.
3. e) There will be two exams that will test students' understanding of the conceptual and analytical frameworks discussed throughout the class.
4. **Generative AI Policy**

The use of generative AI for the purpose of (generating) written assignments and presentations is prohibited.

You may use generative AI to look up certain facts and figures and for clarifying certain terminology or language for the written assignment and presentation.

The use of generative AI is strictly prohibited for and during exams (midterm and final).

9. **Academic Integrity**

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic RegistryLinks to an external site. for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

In particular, any act of cheating on exam will automatically result in an F grade for this course. 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%).