

Service Engineering and Management

1:30pm – 2:50pm, Monday, LSK 1027 9:00am – 10:20am, Friday, LSK 1027

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Office hours: By appointment.

Course webpage: <http://canvas.ust.hk>

Handout, homework assignments, solutions, and other announcements will be posted on this site. Please check this site regularly.

Course Description: Service firms represent the largest and fastest growing sector of the economy, and include banks, healthcare organizations, insurance companies, telephone call centers, restaurants, transportation providers, emergency service providers, and government agencies. The service sector accounts for 70% of Gross Domestic Product and 80% of employment in the United States. In addition, almost every manufacturing firm has business units providing service operations in order to have competitive edges against its competitors and increase customer satisfaction.

Operations Research is essential for improving processes and designing and managing facilities within the service industry. In particular, this course emphasizes quantitative tools that help to address issues such as (i) determining the number and location of service facilities, (ii) the design of process steps, (iii) pricing of perishable resources such as hotel rooms and airplane seats, (iv) capacity planning subject to constraints on customer waiting times, and (v) scheduling staff to accommodate fluctuations in demand. Such decisions are crucial in maintaining a competitive market position and reducing cost for service-oriented firms.

The goal of this course is to provide you with analytical tools and an integrated viewpoint toward managing service firms. The course covers both quantitative and qualitative models that help you to understand the nature of service operation. A tentative list of topics will be covered is:

- Understanding Services: Introduction to Service, Service Strategy
- Designing Service: Develop Service Concept, Understanding Customers and Suppliers
- Delivering Service: Design and Manage Customer Experience, Manage Suppliers, Managing Resources
- Improving Service: Tools to Monitor Service and Finding Problems, Methods to Addressing Problems
- Implement Service: Creating and Implementing the Service Strategy

Learning Objective: This course is intended to provide the concepts and tools needed to prepare students for consulting, engineering, and management opportunities in service firms. At the end of the course, students should be able to

- Identify the fundamental models in many service industries.
- Analyze the models with various tools, contrast and critique solution that have been used in practice.
- *Provide (feasible) suggestions and solutions to improve the existing services.

This course will also provide students with the opportunities to develop their abilities to

- Work effectively in a team and lead a team.
- Communicate with the industry and know how things are done in real word and how to connect practice with knowledge learned in class.
- Read non-text literature critically and present the key findings and approach used by the author.

Prerequisites: Students are expected to have the necessary prerequisite in basic probability (IEDA 2520 Probability for Engineers and IEDA 2540 Statistics for Engineers) and optimization (IEDA 3010 Prescriptive Analytics).

Knowledge in stochastic processes (IEDA 3250 Stochastic Models) and simulation (IEDA4130 System Simulation) would be very helpful, but not required.

Recommended Text: *Service Operations Management: Improving Service Delivery*, by Robert Johnston, Graham Clark, and Michale Shulver. Pearson.

This is only a recommendation. The course will only loosely draw on the text. You do not have to buy this textbook

Required readings: Additional notes covering special topics will be distributed on the course website.

Classroom Procedures: Class sessions will be a mixture of lecture, discussion and presentations.

I encourage everyone to ask questions and express their opinions. This class is much more effective and fun if everyone participates actively and does some outside reading. Since many of the topics that we cover are issues that companies are currently taking a serious look at, you may wish to skim through some of the latest business magazines and papers for new insights.

Case Groups: At the start of the semester, you should form a virtual consulting team of **3, 4, or 5** students and name your company (for example, golden bear consulting Inc.) Over the course of the semester, each team must complete case studies and submit case reports. At the end of the semester, each team must complete a term project. Each member will be asked to evaluate every group member's contribution for all the work in this semester after all the reports are submitted.

Grading: group assignments (40%) and project (60%).

Group Assignments: We will have six group assignments. Some of them will be quantitative problem sets, and some of them will be case studies, depending on topics learned. I will distribute the assignment materials on Canvas. The team should read the materials and answer all the questions. Please submit the write-up before the deadline on Canvas. One group only needs to submit one copy on Canvas.

For case studies, the group need to submit presentation slides in PowerPoint/Pdf format. In class, one or two teams will be selected to present their answers to each question. Other teams will participate the discussion. Your final case score will be based on your case write-ups, your presentations, and your participation in case discussions. For quantitative questions, the group need to write down the calculation steps.

You may discuss your assignments with instructor, TA, fellow students, and others. However, you are expected to write up your solutions on your own.

Course Project: Two types of projects can be done:

Type 1 (Application): Visit a service-based company, interview one or two operations managers, carefully document the processes used in their facility, apply what you have learned in class, and present your findings and recommendations to your classmates.

It is up to the team to select a firm to visit, but you must clear it with me before making initial contact with the company. In many cases, a second visit or a follow-up telephone interview may be necessary. Be sure to allow sufficient time for this possibility.

Given the current situation, face-to-face interviews might not be feasible. You may conduct all interviews over the phone.

Advices on how to contact with local companies project guidelines are provided in hand-out #1.

Type 2 (Strategy Analysis): You may examine corporate service strategies of a firm or firms in a service industry and evaluate their effectiveness, future opportunities, and challenges. You may use the structure of this course—Connect, Deliver, Improve, and Implement—to analyze this firm on a broad level, and then focus on a specific aspect to conduct in-depth analysis.

Your project grade will be determined by the quality of the written and oral reports, and by your active participation in the effort as anonymously evaluated by other members of your group. I will be considering content (e.g., covering key concepts, relating course topics to company practices, providing personal insights), clarity (e.g., logical flow, summarizing key points), general level of professionalism, general aspects of presentation style, effectiveness of visual aids, entertainment value (keeping the audience/reader interested), handling of questions, completing in time limit.