

## **Service Operations for Managers (099)**

### **Course Syllabus**

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| <b>Instructor</b>     | Galit Yom-tov<br><br><a href="mailto:gality@technion.ac.il">gality@technion.ac.il</a>  |
| <b>Office Hours</b>   | I will hold call-in sessions. The zoom link and exact timing will appear on moodle. You can e-mail me, in addition, to setup private meetings. |
| <b>Course TA</b>      | TBD  |
| <b>Class Times</b>    | Thursday 16/5, Sunday 26/5 at 14:30-20:30  |
| <b>Course Website</b> | Moodle   |

### **Course Description**

Services are a large and important part of the world economy. Worldwide, services account for 65% of GDP and 49% of employment; in the United States the numbers are 77% and 79%, respectively (World Bank 2019). It is therefore imperative to develop efficient and effective operations of services. The management of service operations faces quite different constraints, and targets different objectives, than manufacturing operations. The course examines both traditional and new approaches for achieving operational competitiveness in service businesses. It covers service processes at both the strategic and operational decision-making levels, with an emphasis on the latter.

The course covers the following topics: the service concept and operations strategy, the design of effective service delivery systems, capacity management (matching supply and demand) and the optimization of workflows.

Through lectures, a case study, in-class discussion of examples from different service industries, and a final project, we will cover conceptual and analytical frameworks for service management and design. We will apply these to various cases, also underscoring the importance (and increased availability) of data in supporting strategic decisions.

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This course emphasizes data, models, and optimization. It is thus a fairly technical class. It is intended for students interested in general management, analytical consulting, financial services, or operations.

**Course Objectives.** The course stands on three pillars: Data, Models and Optimization. We are going to learn how decisions are made using models, informed by data, and deploying simulation and optimization tools. The case and final project assignments are designed to enable learning yet are realistic enough for you to be able to extend your learning into practical situations you might encounter in the future.

By the end of this course, students will achieve the following goals:

- Develop an understanding of a range of problems faced in service operations management
- Learn conceptual and analytical frameworks.
- Develop an understanding of strategic and operational levels of decisions, and appropriate solution methodology to support each type of decision.
- Apply modeling and data-scientific tools to solve problems in service operations.

**Pre/Co-Requisites.** The core classes 098740 Statistics for Managers is required to learn this course.

### Grading and rules of the game

|                          |                                 |     |
|--------------------------|---------------------------------|-----|
| Pre-course Survey        | Individual                      | 5%  |
| Class Contribution       | Individual                      | 10% |
| Homework                 | Individual and Group (in Pairs) | 40% |
| Final Project (in Pairs) | Group plus Peer Review          | 45% |

**Class contribution (10%).** Your contribution to create and enhance a positive learning environment. This item concerns your positive externality on the learning of others. To that end, I hope you will find it valuable to not just attend, but to contribute to class discussions. You will not be graded for whether or not answers are correct. However, credit will be given for participating in a thoughtful discussion throughout class.

**Online survey (5%).** Before the first class you will have a reading assignment. You will be able to complete Moodle-based surveys related to the 1<sup>st</sup> class material. Credit will be given for completing a thoughtful survey before the start of class. **No credit will be given for surveys submitted late.**

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**Homework (40%):** You will receive assignments to be completed between the 1<sup>st</sup> and the 2<sup>nd</sup> session. One will be a case study to be submitted before the 2<sup>nd</sup> class. We will discuss the case-study assignments in-class the day that they are submitted. In fairness to everyone in the class, I cannot accept late assignments. **A late homework will result in a zero for that assignment.**

**Final project (45%):** The final project will be done in groups after the final day of classes (instead of a test). The project is designed to verify that you internalized the key qualitative insights and quantitative tools derived from working on the cases and from class discussions.

Submissions may not be discussed with anyone outside your study group nor may you use other sources without acknowledgment. It is important that everyone has a level playing field so this also means that materials from previous years or websites cannot be used. It also is extremely important and part of the honor code that each member of a group makes a material contribution to each case analysis of the group. If any individual has not contributed to a write-up, they should not append his/her name to the case report but can submit a separate report their own. It will also be the group's responsibility to ensure that this happens. Given the importance of group work in this class, each member should make every effort to contribute and carry his/her part of the load. *Your grade will reflect peer evaluations to be done at the end of the course.*

Re-grade requests must be submitted via email to me and the TA within 7 days from when the assignment is returned. Along with the graded assignment, you must attach a letter explaining why you are requesting a re-grade. Be as specific as possible. While I will consider the specific concerns cited in your letter, I will re-grade the entire assignment.

## **Class etiquette**

Only paper or "flat tablets" can be used in class, and only for honest class work. (Laptops with vertical screens distract students around you and create a shield between you and others, including the instructor.)

Attendance and butt-in-seat on-time. You will be expected to attend class, and I hope you will find it valuable to contribute to class discussions. Please avoid arriving late as it inflicts negative externalities on your colleagues who came on time.

## **Required Materials**

There is no textbook for this course, but I do recommend you read the following book before taking the course:

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*Uncommon Service: How to Win by Putting Customers at the Core of Your Business.* By Frances Frei and Anne Morriss and published by Harvard Business Review Press (February 7, 2012)

This is a light and relatively short reading with many great stories and examples. It provides an important background story for this course---how to think about what is good service. It does not cover content of this course.

All cases and readings will be found on Moodle.

**Slides.** My slides are a teaching vehicle (not reading or preparation) that I configure depending on the previous class' discussion and what we covered; I put final touches on my slides as I prepare for class the day before. I then post them by the night before class. When I will want you to read something in advance in preparation for class, I will be explicit about that and post sufficiently in advance the relevant material.

**Software.** Will use Excel for data analysis and optimization. Please make sure you have the Analysis ToolPak and Solver add-ins installed before the quarter starts. In practice, R or Python are more common and scalable packages to analyze data. For the interest of focusing on key learnings, Excel will suffice. However, some tasks might be easier to do in R if you are familiar with it. Where there is data, I will provide it in both formats, and you are welcome to choose your favorite software.

## Course outline

The course is divided into two broad topics:

- (1) *Strategy*: We start by characterizing/defining service processes. We then proceed to ask what makes a service process a “good” service processes. Using as a steppingstone the operation strategy framework introduced to students in the core class, we specialize and expand this framework to the world of service operations.
- (2) *Service Workflows*: This portion zooms-in on processes through which service is delivered. We will learn how to analyze data generated by service processes and discuss demand forecasting. We will proceed to the analytical modeling of service processes and various methods of evaluation through dedicated tools (“calculators”) or general-purpose methods like simulation. This portion of the course starts with basic concepts you may have encountered in other courses like capacity and congestion management.

The below is an outline rather than a timeline of the course and the dates are tentative. Some modules will take more time than others.

|                   | Topic | Module and Description   | Assignments   |
|-------------------|-------|--|---|
| Strategy          | 1     | <b>Service Operations Frameworks</b><br>Characteristics of services<br>Service operating strategy<br>The structure of service processes and service blueprinting | <b>Pre-1<sup>st</sup> class Readings:</b><br>a. Shouldice<br>b. The four things<br>c. Breaking the tradeoff   |
|                   | 2     | <b>Data-Driven Modeling</b><br>Data Sources, Estimation and Forecasting  | <b>Tentative planning of Homework (between 1<sup>st</sup> and 2<sup>nd</sup> class):</b><br>(1) Exploratory data analysis and Forecasting (individual)<br>(2) Case study: Manzana (group)<br><br><b>Readings:</b><br>d. <a href="#">A (very) short video on pooling</a> ,<br>e. Capacity Pooling in Hospitals |
| Service Workflows | 3     | <b>Capacity Optimization</b><br>Capacity and Flow Time   |   |
|                   | 4     | <b>Managing Congestion</b><br>Models, analytical and computational (simulation) tools.   |   |
|                   | 5     | <b>Design</b><br>Pooling, Flexibility, and priorities  |   |