Class 13

QED Qs - Part II: Erlang-A;

QED Q's: Economies of Scale; Staffing Moderate-to-Large Service Operations.

Erlang-A (Abandonment); QEDing Palm's model.

Time-Varying Queues:Stabilizing Performance in the Face of Time-Varying Loads.

Optional Reading Assignment: Read the article "Healthcare Call Centers: A Technology Migration", by Howard Bernett. Pay special attention to the following:

1. The Call Center Maturity Model (Figure 1);

2. The calls flow within the call centers (Figure 2), starting with the IVR, through the triage nurse, then to one of the advice groups (internal, pediatrics, obstetrics and gynecology) or appointment agents;

3. In regard to the last paragraph of the article, recall the article

    http://iew3.technion.ac.il/serveng/Lectures/Retail.pdf

    in which an attempt was made to define the Industrial Engineer of the Future.

Recitation 14. Shift Scheduling. Introduction to operational regimes.

HW 11: Empirical Analysis of a Call Center via SEEStat (and the Ofeered-Load).

This HW is based on real data, which you will be analyzing via SEEStat. You will first identify problems with the operation of a call center, and them you will fins staffing remedies for the difficulties found.The latter will require the use of 4CC.
A central role in the homework is the notion of Offered-Load, especially its time-varying version. There is also a part of the homework where you will check the validity of some congestion laws that were studied in class.

The due date for HW 11 is March 2, 2014.

Final Exam: 50% of the Final Grade. Its structure, is as follows:

Question 1: From previous exams (see our WebSite), or from Recitations, or from Lectures, of very similar to one of these.

Question 2: From Homeworks. [Those who know well the material from Lectures, Recitations, Homeworks, are very likely to get a final grade of at least 75-80.]

Question 3: A "Practical Question" with some theoretical insight. [With Question 3 answered well, one can get to a final grade of at least 85-90.]

Question 4: A "Theoretical Question" that requires deeper understanding. [Answering well Question 4 is required in order to get to the levels of 95-100 final grade.]

Topics that were left out, or just touched on:

- Skills-Based Routing

- Queueing Networks: Jackson and Non-Parametric

- New-Service Development (or Service-Engineering in Germany)

- Internet-based services (or Contact Centers)

- Appointments - managing demand (Hall, Chapter 8)

- Service Quality

- Forecasting/smoothing (F&F, Chapter 14)

- Location and (functional) design of service facilities (F&F, Chapters 6, 7)

- Marketing (Lovelock, who also has a book dedicated to the subject)

- Human resource management (Lovelock)

- Technology; Automation

- Convergence of Service and Manufacturing:
  Field service, preventive maintenance, supply chain, life-time value

- Significant Service Sectors:
  - Health, Hospitality (Tourism), Financial, Transportation,
  - Telecommunication, Education, Professional Services,...

What's next?

- The "New-Age Industrial Engineer":
  - Industrial Engineers in Services: Banks, Hospitals, Government, etc.
  - Industrial Engineers in the the interface "Manufacturing – Services":
  - Consulting
  - Startups

- Research: Graduate Programs (Technion, Abroad); M.SC., Ph.D., TA'ing.

- Teaching:
  - Projects (Practical but Theoretically-Based)
  - Further Courses: Deeper (Q-Theory, Stochastic Processes); Broader (CRM, HRM, IE)

PLEASE STAY IN TOUCH, ESPECIALLY IF YOU WORK IN "SERVICES" OR ITS RELATIVES (MY GUESS - WITH PROBABILITY 0.75.)