

IE 383 - Service Operations Management

Tentative Course Outline

Spring, 2006

Topic No.	Date(s)	Topic	Chapter(s)	
1	3/28/2006 Tuesday	3/30/2006 Thursday	Introduction - what are the service industries? Service industries and services in other industries	1,2,3
2	4/4/2006 Tuesday	4/4/2006 Tuesday	Review of EXCEL Solver	
3	4/6/2006 Thursday	4/11/2006 Tuesday	Service delivery and network design - Introduction to basic facility location models <i>Applications: Fire station location, location of service facilities for electric utility repair</i>	4,6,7
4	4/13/2006 Thursday	4/18/2006 Tuesday	Multi-objective location problems <i>Applications: Ambulance location, network design for small package delivery system</i>	4,6,7
5	4/20/2006 Thursday	4/25/2006 Tuesday	Yield management and demand management <i>Applications: Hotel rooms, car rentals, airline seat reservation systems</i>	10
6	4/27/2006 Thursday	5/4/2006 Thursday	Workforce management and scheduling <i>Applications: productivity at the Federal Reserve (check clearing operations), fast food restaurants</i>	
	5/2/2006 Tuesday	5/2/2006 Tuesday	Midterm exam (TENTATIVE DATE)	

7	5/9/2006 Tuesday	5/9/2006 Tuesday	Analyzing and modeling queues <i>Applications: bank waiting lines, check-in lines at airports</i>	11, 18
8	5/11/2006 Thursday	5/11/2006 Thursday	Managing and optimizing queues <i>Applications: Design of health care operations, check-out lines at a grocery</i>	11, 18
9	5/16/2006 Tuesday	5/16/2006 Tuesday	Design and Operation of Call Centers	notes
10	5/18/2006 Thursday	5/18/2006 Thursday	Call centers	notes
11	5/23/2006 Tuesday	5/25/2006 Thursday	Airline scheduling <i>Applications: Aircraft routing, crew pairing, bidline scheduling.</i>	notes
12	5/30/2006 Tuesday	6/1/2006 Thursday	Auctions and the Impact of the Internet on Services	7

Thursday 6/8/2006 Thursday	FINAL EXAM	11a.m.-1p.m.
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Instructor(s):

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 TBA (GOKPINAR)

Note: If these hours do not work for a large percentage of the class, alternate times will be arranged. Also, if the posted office hours do not work for you for some reason, please do **not** hesitate to contact me (Daskin) by e-mail or phone to set up another mutually convenient time. **I really mean this!!**

Course Requirements:

Students will be graded on the following:

Homework assignments (approximately one per week)	35
Quiz/Midterm	20
Final	25
Class participation (see below)	20

Students are expected to come to all classes (unless they notify me in advance that they will not be able to attend a particular class). Students are expected to have read the assigned readings from the list above and to be prepared to discuss the readings in class. Students will be assigned to teams and each team will be asked to present one or more of the papers in class. Other students are expected to contribute to these discussions as well.

Brief Course Description: The service industry accounts for about 75% of the US employment and almost 60% of all personal consumption. This course will explore the service industries in the US (e.g., transportation, health care, retailing, restaurants, education, emergency services) with a view toward developing models that allow planners to reduce costs and enhance customer service. Topics to be covered include facility location planning for services (e.g., ambulances, fire stations, repair facilities), workforce planning and scheduling, yield and demand management, queuing analysis and design of waiting lines, call center management, airline crew scheduling, auctions and the impact of the Internet on services.

In addition to learning about the service industry, the course has a secondary objective of introducing students to the non-textbook literature. Much of the course will be based on case studies that were documented in *Interfaces*, a journal published by INFORMS, the Institute for Operations Research and the Management Sciences. This journal is designed to be accessible to a broad range of readers including undergraduate and graduate students, working engineers and managers. Students will be exposed to a number of papers in the literature spanning a variety of problems in the service operations management and a number of different industries. Students will also learn to read such papers critically and to present the key findings and approaches used by the authors. A portion of roughly every third or fourth class section will be devoted to such student presentations.

Recommended Text: The recommended text for this course is:

Fitzsimmons, J. A. and M. J. Fitzsimmons, 2004, Service Management: Operations, Strategy and Information Technology, Irwin/McGraw Hill, Boston.

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

Required Readings:

Much of the course, however, will be based on readings from the literature (mostly from the journal *Interfaces*). Most of the papers will be available in the form of a course packet that you can buy in the IE/MS office; for others you will have to download the papers from the Internet. Links to these papers will be provided on Blackboard.

Location Modeling:

Current, J., Daskin, M. and D. Schilling, 2002, "Discrete Network Location Models," chapter 3 in Facility Location Theory: Applications and Methods, Z. Drezner and H. Hamacher eds., Springer-Verlag, Berlin, pp. 81-118.

Gavirneni, S., L. Clark, and G. Pataki, 2004, "Schlumberger optimizes receiver location for automated meter reading," *Interfaces*, **34**:3, 208-214.

Dekle, J., M. S. Lavieri, E. Martin, H. Emir-Farinas, and R. L. Francis, 2005, "A Florida County Locates Disaster Recovery Centers," *Interfaces*, **35**:2, 133-139.

Yield Management and Demand Management:

Geraghty, M. K. and E. Johnson, 1997, "Revenue Management Saves National Car Rental," *Interfaces*, **27**:1, pp. 107-237.

Workforce Management:

Bodin, L. and A. Panken, 2003, "High tech for a higher authority: The placement of graduating rabbis from Hebrew Union College - Jewish Institute of Religion," *Interfaces*, **33**:3, pp. 1-11.

Shrimpton, D. and A. M. Newman, 2005, "The US Army Uses a Network Optimization Model to Designate Career Fields for Officers," *Interfaces*, **35**:3, 230-237.

Abbink, E., M. Fishetti, L. Kroon, G. Timmer, and M. Vromans, 2005, "Reinventing Crew Scheduling at Netherlands Railways," *Interfaces*, **35**:5, 393-401.

Gordon, L. and E. Erkut, 2004, "Improving Volunteer Scheduling for the Edmonton Folk Festival," *Interfaces*, **34**:5, 367-376.

Queueing Systems:

Daskin, M. S., 2006, "Moment Generating Functions," Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, IL 60208.

Daskin, M. S., 2003, "Notes on Queueing Theory," Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, IL 60208.

Daskin, M. S., 2003, "Additional on Queueing Theory," Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, IL 60208.

Call Centers:

Gans, N., G. Koole, and A. Mandelbaum, 2003, "Telephone Call Centers: Tutorial, Review, and Research Prospects," *Manufacturing and Service Operations Management*, **5**:2, pp. 79-141. (to be downloaded by students)

Airline Scheduling:

Armacost, A. P., C. Barnhart, K. Ware, and A. M. Wilson, 2004, "UPS Optimizes Its Air Network," *Interfaces*, **34**:1, 15-25.

Van den Briel, M. H. L., J. R. Villalobos, G. L. Hogg, T. Lindemann, and A. V. Mule, 2005, "America West Airlines Develops Efficient Boarding Strategies," *Interfaces*, **35**:3, 191-201.

Auctions:

Rothkopf, M. H., and S. Park, 2001, "An Elementary Introduction to Auctions," *Interfaces*, **31**:6, pp. 83-97.

Ledyard, J. O., M. Olson, D. Porter, J. A. Swanson, and D. P. Torma, 2002, "The first use of a combined-value auction for transportation services," *Interfaces*, **32**:5, pp. 4-12.

Sheffi, Y., 2004, "Combinatorial auctions in the procurement of transportation services," *Interfaces*, **34**:4, pp. 245-252.

NU DISABILITY POLICY

(For further information, please check the following web site:

<http://www.northwestern.edu/disability/index.html>)

Northwestern University is proud to welcome and support a diverse student body. By removing some of the barriers to education that students with disabilities often experience, we hope to create a learning environment that encourages and challenges all students.

Northwestern University provides a variety of services to assist students with disabilities in becoming active members of the University community. Services vary according to the type and level of impairment experienced by each student. The majority of these services are coordinated by the Office of Services for Students with Disabilities (SSD).

Appropriate services and accommodations are determined on a case-by-case basis. Students with questions about eligibility for services are encouraged to contact SSD. Depending on students' needs and limitations, documentation, history of accommodations and educational environment, SSD may provide the following as appropriate: scribe and reader services; note-taking services; materials in e-text and audio format; testing accommodations, such as extended time and alternative test environment; interpreter and captioning services; assistance in activity relocation; assistance in obtaining elevator and lift keys; access to adaptive equipment and software.