

Carnegie Mellon University
Models and Methods for Optimization (Math 21-257)
Spring 2005

Instructor Information

Dr. Ashwin Vaidya
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www.math.cmu.edu/~avaidya (Please go to the website for a link to the course page. You will find a copy of the syllabus through this site and I will also occasionally place materials and useful links here).

Class Schedule

Lectures : MWF, 2:30-3:20pm, DH 2210

Recitations : Section A, 1:30 DH2105

Section B, 1:30 DH1217

Section C, 2:30 DH2105

Section D, 3:30 DH2105

Section E, 3:30 DH1217

Text Book

Introduction to Mathematical Programming, Russel Walker, 1999.

Course Outline

The objective of this course is to introduce the subject of linear programming. This course is designed with students of business, economics and related subjects in mind, although students from other disciplines are welcome to take it as well. The course will be self-contained for the most part; prerequisites include a sound foundation of algebra and elementary calculus. We will discuss topics such as vectors, matrices and use them to understand the basics of linear programming including the simplex method, transportation problem and the knapsack problem among others.

Office Hours

Instructor : M, F 1:00-2:00 pm or by appointment

TA's will also have additional office hours, which will be announced in class/recitation upon finalization.

Attendance Policy

Students are expected to attend class regularly and are responsible for missed lecture notes and announcements. If you know you will be missing a class ahead of time, please inform me of your absence and make arrangements with your classmates to obtain notes for the missed lecture.

Classroom Expectations

Everyone involved must contribute to a positive learning environment in both lectures and recitations. Please arrive on time, not leave early, keep cell phones turned off during lectures, not converse with fellow students during the lecture and use laptops only for note-taking.

Grading

The final grade will be based on the following:

3 Tests During the Term : 45 %

Final Exam : 30%

Homework : 25%

Homework

Homework problems will be assigned as per the schedule indicated below and must be returned to your TA. You may work in groups but each student will have to turn in an independent homework set. Please make sure the work is legible and neat so we may understand your work. Late Homework assignments will not be accepted after the due date. Only selected problems will be graded but you must turn in all the assigned problems.

Makeup Policy

Makeups are discouraged and will be given only upon prior notice, to the instructor or TA, of absence or in case of emergencies. Grading scheme mentioned above will be strictly adhered to and not changed or adjusted for any student.

Exam Dates

Dates for the tests and exams are mentioned on the schedule below and will also be announced in class well ahead of time.

Grade Assignment

Grade distribution is according to the following scheme:

90 – 100 : A

80 - 89 : B

70 - 79 : C

60 - 69 : D

Less than 60 : F

Schedule for the Course (Tentative)

01/10	Introduction to the course.
01/12	Types of problems (1.2,1.3).
01/14	Graphical solutions (1.4), HW1
01/17	No Class
01/19	-contd.-
01/20	HW1 due
01/21	Introduction to vectors (2.1,2.2)
01/24	Introduction to matrices (2.4)
01/26	Linear independence (2.5), HW2
01/28	Systems of equations (2.6)
02/31	Inverse of a matrix (2.7)
02/02	Introduction to linear programming (3.1,3.2)
02/03	HW2 due
02/04	The simplex algorithm (3.3), HW3
02/07	-contd.-
02/09	Review

02/11	Test 1
02/13	Basic feasible solutions, extreme points (3.4)
02/14	HW3 due
02/15	Formulation examples (3.5)
02/18	-contd.-
02/20	The simplex algorithm for general constraints (3.6), HW4
02/22	-contd.-
02/25	Introduction to Excel Solver
02/28	The simplex dual problem (3.7)
03/02	-contd.-
03/03	HW4 due
03/04	-contd.-
03/14	Sensitivity analysis (3.8), HW5
03/16	-contd.-
03/18	-contd.-
03/21	Test 2
03/23	Network problems (4.1)
03/24	HW5 due
03/25	-contd.-
03/28	-contd.-, HW6
03/30	Integer programming (7.1)
04/01	The knapsack problem (7.2)
04/04	Integer programming models (7.6)

04/06	-contd.-
04/07	HW6 due
04/08	-contd.-
04/11	The traveling salesman problem (7.7), HW7
04/13	-contd.-
04/15	No class
04/18	-contd.-
04/20	Review
04/21	HW7 due
04/22	Test 3
04/25-29	Review for Final Exam
05/02-06	Final Exam Week.