

MA3231 Syllabus

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Office hours: 10:00–11:00 MTRF
or by appointment, or just stop by ...

MA 3231 – A01, A Term 2009
Linear Programming
Text: “Linear Programming:
Foundations and Extensions”
by Robert J. Vanderbei (3rd ed.)
Meetings: 9-9:50 MTRF, SH203

The goal of this course is to introduce the student to the theory, algorithms and applications of linear optimization. The subject and many relevant texts are arguably misnamed. I will explain this in class.

Requiring only a background in basic linear algebra, we will explore a range of linear programming problems from various disciplines. The general theme is to minimize cost, or maximize profit, subject to some set of linear constraints (inequalities). We will develop a theory by looking at algebraic structures, geometric objects and algorithmic issues related to solving such problems. Our focus will be on the mathematics of solving such problems, with modeling and computational issues as secondary interests.

Topics will include: modeling, polyhedra, the simplex method, the revised simplex method, duality, sensitivity analysis, parametric analysis, state-of-the-art algorithms, applications.

TERM SCHEDULE

Here is a rough outline of what I expect us to cover in the 28 class meetings:

Aug. 27 and Aug. 28	<i>Introduction</i>	Chapters 1 & 2
Aug. 31 to Sep. 4	<i>Simplex Method, Degeneracy</i>	Chapters 2,3,4
Sep. 8 to Sep. 11	<i>Duality</i>	Chapter 5
Sep. 14 to Sep. 18	<i>Matrix Notation, Sensitivity</i>	Chapters 6, 7
Sep. 21 to Sep. 25	<i>Dual Simplex</i>	Chapter 9
Sep. 28 to Oct. 2	<i>Game Theory</i>	Chapter 11
Oct. 5 to Oct. 9	<i>Path Following, Affine Scaling</i>	Chapter 21
Oct. 12 to Oct. 15	<i>additional topics, catch-up</i>	Chapters 10,17,18 (as time permits)

GRADES

A: 100 % – 88 %; **B:** 87.99 % – 74 %; **C:** 73.99 % – 60 %

GRADING SCHEME

Homework (best 5 out of 7 assignments): 25 %
Quizzes on reading (up to 4, as needed): 9 %
3 Tests (Sept. 11, Oct. 1, Oct. 15): 66 %

Due dates for assignments will be determined when the assignments are distributed. In most cases, late assignments will not be accepted for credit.

There will be **no** make-up tests. All students are expected to attend all tests.

STUDENTS WITH DISABILITIES

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Services Office (DSO) as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located in Daniels Hall and may be reached at (508) 831-5235.

If you are eligible for course adaptations or accommodations because of a disability (whether or not you choose to use these accommodations), or if you have medical information that I should know about please make an appointment with me immediately so we may discuss these issues.

WPI'S ACADEMIC HONESTY POLICY

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies which can be found at

<http://www.wpi.edu/Pubs/Policies/Honesty>

All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see Dr. Martin.

INFORMATION ON THE WEB

The course web page is

<http://www.wpi.edu/~martin/TEACHING/current.html>

From there, you can also reach the web page of the author of our text.