MA3231 Syllabus

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or by appointment, or just stop by ...

MA 3231 – A01, A Term 2018
Linear Programming
Text: "Linear Programming: Foundations and Extensions" by Robert J. Vanderbei (3rd ed.)
Meetings: 10-10:50 MTRF, SL105

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, the simplex method, duality, the dual simplex method, sensitivity analysis, convex geometry, game theory, the affine scaling method, applications.

TERM SCHEDULE

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

Aug. 23 and Aug. 24	*Introduction*	Chapters 1 & 2
Aug. 27 to Aug. 31	*Simplex Method, Degeneracy*	Chapters 2,3,4
Sep. 4 to Sep. 7	*Duality*	Chapter 5
Sep. 10 to Sep. 14	*Matrix Notation, Sensitivity*	Chapters 6, 7
Sep. 17 to Sep. 21	*Dual Simplex*	Chapter 9
Sep. 24 to Sep. 28	*Game Theory*	Chapter 11
Oct. 1 to Oct. 5	*Path Following, Affine Scaling*	Chapter 21
Oct. 8 to Oct. 11	*additional topics, catch-up*	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. 13, Sep. 27, Oct. 11):	66 %

Due dates for assignments will be determined when the assignments are distributed[1] In most cases, late assignments will not be accepted for credit. But you can ask.

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

[1]The initial plan is to have assignments due on Tuesdays.

ACADEMIC INTEGRITY

As a student in this course, you are expected to familiarize yourself with WPI's Academic Integrity policies which can be found at

`https://www.wpi.edu/about/policies/academic-integrity`

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 Professor Martin (or check here).

STUDENTS WITH DISABILITIES

If you need course adaptations or accommodations because of a disability, or if you have medical information to share with me that may impact your performance or participation in this course, please make an appointment with me as soon as possible. If you have approved accommodations, please request your accommodation letters online through the Office of Disability Services Student Portal.

If you have not already done so, students with disabilities who need to utilize accommodations in this class are encouraged to contact the Office of Disability Services (ODS) as soon as possible to ensure that such accommodations are implemented in a timely fashion. This office can be contacted via email: DisabilityServices@wpi.edu, via phone: (508) 831-4908, or in person: 124 Daniels Hall.

INFORMATION ON THE WEB

The course web page can be found at

`http://users.wpi.edu/~martin/TEACHING/3231/`

All reading assignments and homework assignments will be posted on this web page. Limited materials will be posted in Canvas, but always check the course web page too.