

MA 380 – Introduction to Linear Programming Syllabus – Winter 2017

INSTRUCTOR: Bao TRUONG

MEETING: MWF 3 – 3:50 p.m. at Jamrich 1315

OFFICE HOURS: MWRF 4 – 6:00 pm, or by appointment at Jamrich 2216

E-MAIL: btruong@nmu.edu

TEXT:

Understanding and Using Linear Programming. by Jiri Matousek, Bernd Gartner, Springer, 2007.

Linear Programming and Extensions. by George Bernard Dantzig. RAND. R-366-PR, 1963.

COURSE GOAL: Discuss Linear Programming as a mathematical technique to model decision and optimization problems relevant in engineering, various industries and other applications, as well as methods for solving the resulting models and interpret the solutions. Since Linear Programming bridges the fields of engineering and applied and pure mathematics, the goal of this course is to teach you to formulate, analyze, and solve mathematical models that represent real-world problems. We will also discuss how to use EXCEL or solving optimization problems.

EXPECTED LEARNING OUTCOMES: Students who successfully complete MA380 should be able to

1. formulate a real-world problem as a mathematical programming model;
2. implement and solve the model in EXCEL;
3. understand the theoretical workings of the simplex method for linear programming and perform iterations of it by hand;
4. understand the relationship between a linear program and its dual, including strong duality and complementary slackness;
5. perform sensitivity analysis to determine the direction and magnitude of change of an optimal solution as the data change;
6. solve specialized linear programming problems like the transportation and assignment problems;
7. understand the applications of, basic methods for, and challenges in integer programming.

Evaluation of these learning outcomes will be done through assignments, tests, and exams.

EXAMS: There will be two midterm exams on Wednesday February 22 and Wednesday April 19. There will be a final exam on Thursday, May 4 (2-3:50 p.m.) on the final exam week. The exam dates were set and will not be changed. Please make all your arrangements based on the exam dates. No make-up will be given.

PROJECT: You are required to read a linear programming simplex method and write a report on it. The details of the project guidelines will be provided in a separate document by the instructor.

HOMEWORK: Homework is due every Friday at 3:00 p.m. Late homework will not be accepted without prior approval.

GRADES: Grading Scale

A (93% up) A – (90 – 92.9%) B + (87 – 89.9%) B (83 – 86.9%) B – (80 – 82.9%)

C + (77 – 79.9%) C (73 – 76.9%) C – (70 – 72.9%) D + (67 – 69.9%) D (60 – 66.9%)

Weighted percentage: Tests 30%, Project 10%, Quizzes 10%, HW 20%, Final 30%

The grading may be less stringent, but not more stringent, than this.

EDUCAT: I will use the web page <https://educat.nmu.edu/> to post readings, homework assignments and their solutions, and other information about the course. Please check there regularly for updates. If you haven't done so already, please make sure you forward your NMU email to an email account that you frequently use. Otherwise, you might be missing some important information.

ACADAMIC NEEDS: If you have a need for disability-related accommodations or service, please inform the Coordinator of Disability Service in the Disability Service Office by either coming into the office at 2001 C.S. Hedgcock, or calling 227 – 1700, e-mailing disserv@nmu.edu. Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state and university guidelines.

TEACHING IMPROVEMENT: Please feel free to make suggestions to improve the content of the class and my instruction skills. You can tell these suggestions directly to me or anonymously leave your comments in my mailbox or slide them under my office door.