SIE 500C: Linear Programming

Linear programming is one of the primary, and most widely used tools developed by members of the Operations Research (OR) community. OR involves the analysis of problems, usually decision making problems, leading to the development of models and solution procedures that have proven to be useful in a variety of settings.

In this course, you will explore several aspects of linear programming. We will spend a lot of time and effort "modeling" problems as linear programs, and learning how solve them.

Catalog Description: Linear programming models, solution techniques, and duality. Prerequisites: matrix methods for systems of linear equations

Objectives: SIE 500 is intended to lay the foundation for successful matriculation through any of the graduate programs offered primarily through the SIE department at the UA. SIE 500c is an introduction to linear programming. Upon completion of SIE 500c, the student should be able to develop an appropriate linear programming model from a verbal description of a problem, solve the linear program, and extract relevant information from the solution.

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Textbook: Winston, W. L. and Venkataramanan, M., *Introduction to Mathematical Programming*, ISBN: 0-534-35964-7, Edition: 4, Publisher: ITP EDUC/THOMSON LEARNING.

Topics in this class and the anticipated effort level include:

Modeling LPs (30%)
Solving LPs (30%)
Senstivity Analysis (20%)
Duality (20%)

Each major topic in this class is organized into a series of e-lectures, as follows:

Although you will have access to all of the lectures for the entire course, I recommend that you work through the lectures in the order indicated. There will be an assignment for each of the topics indicated, as well as a final exam. As you work your way through the course, you will occasionally encounter questions followed by dialogue boxes in which you are expected to provide your answer to the questions. These will be used to assess your "class participation." Your grade for the course will be based on each of these pieces, as follows:

Assignments (45%) – three assignments

Exam (45%) – one final exam

Participation (10%) – through some short questions in lectures