

## MATH 461 - LINEAR PROGRAMMING

Nicholls State University, Fall 2006

**Instructor:** Dr. Brian Heck

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My office hours will be 9-1 and 2-3 (M, W) and 2-3 (T, Th). Please drop by my office if you have any questions. If I am not in my office during my scheduled office hours, then I am wandering the halls of Peltier. Please hang around or come and find me. If for some reason I am unable to hold office hours, I will put a note on my door.

**Prerequisite:** Math 360.

**Text:** *Elementary Linear Programming with Applications* (2<sup>nd</sup> ed.) by Bernard Kolman and Robert E. Beck (Academic Press)

This is an excellent textbook that I have taught from many times before. We will cover most of the first three chapters and then some selected topics from the last two chapters. We will follow the order of the sections pretty faithfully.

**Course Description (catalog):** Geometry of linear programming; matrix notations; extreme point theorem; basic solutions; the simplex method; slack, excess, and artificial variables; duality; sensitivity analysis; integer programming with applications.

**Course Description (instructor):** We will begin the semester with a thorough description of linear programming (LP) problems. The Simplex Method of George Dantzig will be introduced next, and we will use it to solve a wide variety of LP problems. We will also study the Dual Simplex Method, the Revised Simplex Method, and sensitivity analysis. Finally, we will wrap up our semester with the study of some special types of LP problems.

**Course Objectives:** At the completion of this course, a student will be able to:

- describe complex real-world problems using mathematical modeling
- visualize problems, and their solutions, involving two variables
- translate mathematical formulations of problems into different forms
- solve LP problems using various tools such as slack and excess variables,

- the simplex method, duality, networks and more
- explain the strengths and weaknesses of the various methods for solving LP problems
  - interpret the solutions generated by the various methods of solving LP problems and formulate practical solutions to the real-world problem
  - use the available computer software to aid in the solving of LP problems
  - solve network flow problems using the various methods

**Grading Policy:** We will have four (4) equally weighted exams. The fourth (final) exam will be neither comprehensive nor optional.

**Approximate Class Schedule:** Below is a list of the sections we will cover this semester. If time allows, more sections may be added. If time does not allow, some sections may be skipped. The tentative dates of our four exams are included. I do not expect the dates to change, but if they do, you will be notified in class.

Sections 1.1-1.5  
**\*\*Test #1...Thursday, Sept 14\*\***

Sections 3.1-3.7  
**\*\*Test #3...Thursday, Nov 2\*\***

Sections 2.1-2.3  
**\*\*Test #2...Thursday, Oct 5\*\***

Sections 4.1, 5.1-5.6  
**\*\*Test #4...Thursday, Dec 7\*\***  
**\*\*8:00-10:00 am\*\***

**Attendance/Expectations:** Students are expected to attend all classes. Excuses for missed classes will be handled on an individual basis. In any event, each student is responsible for all material covered in class. It is expected that you will pay attention, be respectful of your instructor and fellow students, and follow the Code of Student Conduct. Instances of academic dishonesty will be dealt with severely. If you are caught cheating, you will fail this course. Similarly, if you are a disruptive presence in the classroom, you will be dropped from the class.

**Disability:** If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of your academic accommodations. The Office of Disability Services is located in Peltier Hall, Room 100-A. The phone number is (985) 448-4430 (TDD 449-7002).