

# MATH 461

## LINEAR PROGRAMMING

Nicholls State University, Fall 2004

### Contact Information

Instructor: Dr. Brian Heck

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Office Hours: 8:30 - 9:30 a.m., 12:00 - 1:00 p.m. M, W, F  
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### Course Information

**Prerequisite:** Completion of Math 360.

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

### ***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 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 duality, the Dual Simplex Method, the Revised Simplex Method, and integer programming as time allows. Finally, we will wrap up our semester with the study of some selected applications.

### ***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 not be comprehensive or 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...Monday, September 13\*\***

Sections 3.1-3.6  
**\*\*Test #3...Monday, November 1\*\***

Sections 2.1-2.3  
**\*\*Test #2...Monday, October 4\*\***

Sections 4.1-4.3, 5.1-5.6  
**\*\*Test #4...Wednesday, December 1\*\***

### ***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 assumed that you are attending this university because you have a desire for higher learning. It is therefore 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).