1 General Course Information

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Meeting time: M-W 16:10-17:25 pm
Meeting place: EB 202
Office Hours: M 17:25-18:25 pm, W 11:00 am-12:00 pm, or by appointment
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TA Office: EB 233
Webpage: http://blackboard.wichita.edu

2 Course Overview

Operations research (OR) has many applications in science, engineering, economics, and industry and thus the ability to solve OR problems is crucial for both researchers and practitioners. Being able to solve the real life problems and obtaining the right solution requires understanding and modeling the problem correctly and applying appropriate optimization tools and skills to solve the mathematical model. 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 and LINDO for solving optimization problems. In particular, we will cover linear programming, network flow problems, integer programs, nonlinear programs, dynamic programming and queueing models.

3 Course Objectives

Upon completion of this course, you will be able to:

1. Formulate a real-world problem as a mathematical programming model
2. Implement and solve the model in EXCEL and LINDO
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 a model’s optimal solution as the data change
6. Solve specialized linear programming problems like the transportation and assignment problems
7. Solve network models like the shortest path, minimum spanning tree, and maximum flow problems
8. Understand the applications of, basic methods for, and challenges in integer programming
9. Understand how to model and solve problems using dynamic programming
10. Model a dynamic system as a queuing model and compute important performance measures
11. Learn optimality conditions for single- and multiple-variable unconstrained and constrained non-linear optimization problems, and corresponding solution methodologies
4 Course requirements

4.1 Prerequisites
Familiarity with linear algebra is required (e.g. Math 511 Linear Algebra or a basic Linear Algebra class)

4.2 Required readings

4.3 Recommended readings

4.4 Topics
The following is a tentative outline of the course. I may add or remove some topics depending on the interest of the students and the pace of the class. Please tell me if there are other topics that you would like to see covered in the class, and I will do the best I can to accommodate your requests regarding the course content.

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<td><strong>Linear Programming</strong></td>
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4.5 Homework quizzes
There will be a 15 minutes quiz which will have a question similar to the homework problems assigned in the previous week. There will be no make-up quiz.

4.6 Software Assignments
There will be software assignments where EXCEL and LINDO will be used to solve several OR problems. All assignments must be returned by the beginning of the class.
4.7 Exams
There will be two midterm exams on **Wednesday September 28** (class time) and **Wednesday October 26** (class time) in class. There will be a final exam on **Wednesday December 14** (3-4:50pm) 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.

4.8 Project
You are required to read a linear programming application paper and write a report on it. You will read and summarize the purpose, main points, and OR tool in the paper. The details of the project guidelines will be provided in a separate document by the instructor.

4.9 Grading
Semester grades will be based on the four main scores:
- 20% In class Quizzes
- 5% Software Assignments
- 10% Class Project
- 20% Midterm 1
- 20% Midterm 2
- 25% Final Exam

5 Other Policies or Procedures
5.1 Academic Honesty
You must abide by WSU’s academic honesty policy (see page Undergraduate Catalog or Graduate Bulletin for a description of this policy). An excerpt from the policy is provided for your guidance as follows: “Students who compromise the integrity of the classroom are subject to disciplinary action on the part of the University. Violations of classroom standard include:
1. Cheating in any form, whether in formal examinations or elsewhere
2. Plagiarism, using the work of others as your own without assigning proper credit to the source
3. Misrepresentation of any work done in the classroom or in preparation for class
4. Falsification, forgery, or alteration of any documents pertaining to academic records
5. Disruptive behavior in a course of study or abusiveness toward faculty or fellow students.”

5.2 Blackboard
I will use the web page http://blackboard.wichita.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 blackboard email to an email account that you frequently use. Otherwise, you might be missing some important information.

5.3 Accommodations for Students with Disabilities
If you have a disability or a special need for which you are or may be requesting accommodations, please contact both me and the Office of Disability Services (DS) as early as possible in the semester. The office website is http://webs.wichita.edu/?u=disservp=/index. You must submit appropriate documentation to the instructor before accommodations can be granted. DS will review your concerns and determine, with you, what accommodations are necessary and appropriate for you. All information and documentation of your disability is confidential and will not be released by DS without your written permission.
5.4 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.