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Office Hours: 8:00-10:00am Wednesday, 2:00-4:00pm Thursday, or by appointment

Textbooks: *Applied Mathematical Programming Using Algebraic Systems*
Bruce A. McCarl and Thomas H. Spreen
Self-published. <http://agecon2.tamu.edu/people/faculty/mccarl-bruce/books.htm>

Selected readings available on the CSU RamCT site as announced.
{<http://ramct.colostate.edu>}

Description: This is a graduate-level course in applied economics. As stated in the University general catalog, this course will address “the theory and practice of optimization techniques used in economic applications with emphasis on linear and nonlinear programming.” The course will emphasize the understanding the types of economic problems where these tools are appropriate, the means to formulate models and solve them, and the interpretations of results.

Prerequisites: AREC 506 Applied Microeconomic Theory

Objectives: After completing this course, a successful student will be able to:

- 1) Understand the theory and framework of the linear programming (LP) model
- 2) Formulate, solve, and fully interpret the results from an LP model
- 3) Understand the theory and approaches to solving nonlinear programming models
- 4) Use appropriate techniques to formulate, solve, and fully interpret the results from a nonlinear programming model
- 5) Diagnose deficiencies and identify limitations in mathematical optimization models
- 6) Use appropriate mathematical programming techniques to address questions of economic significance
- 7) Understand how to incorporate risk into a mathematical programming model
- 8) Understand how to appropriately reflect temporal decisions within an optimization model

Grading Policy: Course grades will be based on problem sets, a midterm examination, a final exam, and a course project. The components will be weighted as follows:

Homework	40%	(8-10 assignments expected)
Midterm Exam	15%	(tentatively in October 9-16)
Research Project	25%	(includes presentation—details pending)
Final Exam	20%	(11:50-1:50, Monday, Dec. 15)

Final grades will be assigned based on total point accumulations as follows: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = <60%. Requirements for each grade category may be adjusted downward but will not be raised. Pluses and minuses will be awarded at the instructors' discretion.

Academic Integrity: We take academic integrity seriously. At minimum, academic integrity means that no one will use another's work as their own. The CSU writing center defines plagiarism this way:

Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding "credit be given where credit is due." Source: (Writing Guides: Understanding Plagiarism. <http://writing.colostate.edu/guides/page.cfm?pageid=311> Accessed, August 21, 2014)

If you plagiarize in your work you will lose credit for the plagiarized work, fail the assignment, or fail the course. Plagiarism can result in expulsion from the university. Each instance of plagiarism, classroom cheating, and academic dishonesty in general will be addressed according to CSU published policies. (See <http://www.catalog.colostate.edu/Content/files/2014/FrontPDF/1.6POLICIES.pdf>)

Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. This includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, we will ask to you sign the CSU Honor Pledge as part of completing all of our major assignments. You will be prompted to write and sign the following statement on all of your graded assignments, quizzes, and exams:

"I have not given, received, or used any unauthorized assistance."

You can visit <http://tilt.colostate.edu/integrity/honorpledge/> to read more about CSU's Honor Pledge as well as finding links to a number of other resources that address academic integrity.

Course Outline

(with tentative time allocation)

- I. Introduction (Week 1)
 - A. Modeling and Decision Analysis

- II. Linear Programming (Weeks 2-5)
 - A. Formulation
 - B. Solution Algorithms
 - C. Duality and Sensitivity Analysis
 - D. Basic Applications
 - E. Modeling with GAMS

- III. Integer Programming (Week 6-7)
 - A. Formulation
 - B. Solution Algorithms
 - C. Applications

- IV. Nonlinear Programming (Weeks 8-10)
 - A. Formulation
 - B. Theory of solution and algorithms
 - C. Applications (including market models)

- V. Risk Modeling (Weeks 11-12)

- VI. Time in Optimization Models-Intro to Dynamics (Weeks 13-14)

- Week 15 dedicated to project presentations

Detailed Course Schedule forthcoming

I have an "open door" policy for visitors in my office. You are always welcome to drop by if you have an issue that you wish to discuss with me. However, please realize that I have many other responsibilities beyond teaching this class, so I may be forced to schedule to meet with you later. I do schedule office hours each week that I set aside for meeting with students from my current courses. If at all possible, I prefer that you try to use this time to meet with me. I make every attempt to be in the office during these hours and will try to announce in class the days that I will not be available during this time.

I welcome you to this course and look forward to sharing the next 16 weeks with you. I hope that we both have a fruitful and prosperous semester. Good luck to you!