

Math 323 (Andrews 201 MWF 11-11:50)
Operations Research I—Deterministic Models
Course Syllabus—Fall 2009

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Office Hours—TBA or by Appt.

PREREQUISITES:

M211 or equivalent experience in elementary multivariate calculus, linear algebra, manipulating matrices, and representing weighted sums in matrix notation.

DESCRIPTION:

M323 is the first of two introductory courses in operations research. It focuses on the optimization (or mathematical programming) part of operations research—models in which the decisions are variables and we can (sometimes) solve or search for a good decision. We discuss how to form optimization models, how to solve and analyze them, and how to recognize tractable cases. Emphasis is placed on linear programming models. These models are well understood and are of great practical significance. Other areas of optimization are also introduced. M424 is the second introductory course. In it, operations research models having probabilistic elements are studied.

TOPIC OUTLINE:

1. Introduction and Class Organization [1 lecture]
2. Concepts of Operations Research Modeling [4 lectures] Chapters 1 and 2
3. Concepts of Optimization Search [6 lectures] Chapter 3
4. Linear Programming Algorithms [6 lectures] Chapter 5 (omit 5.4,5.9)
 - Exam 1
5. Modeling with Linear Programming [3 lectures] Chapter 4
6. Linear Programming Duality and Output Analysis [6 lectures] Chapter 7
7. Shortest Paths and Dynamic Programming [3 lectures] Chapter 9 (omit 9.4,9.8)
 - Exam 2
8. Network Flows [3 lectures] part of Chapter 10
9. Discrete Optimization [6 lectures] Chapters 11 and 12
 - Comprehensive Final Exam (Monday, Dec. 14, 9-noon)

TEXT:

Optimization in Operations Research, Ronald L. Rardin, Prentice Hall (1998). The text is available at your friendly neighborhood bookstore.

HOMEWORK:

Regular homework emphasizing and extending lecture material will be assigned and graded. Students may (your option) submit homeworks jointly with one partner. However, each student is responsible for all tasks in the homework. Partners submitting joint homework should submit just one copy with both names on it. They will both receive the same score. Typically, homeworks will be scored on the basis of 50-150 points. They will not count equally. Late homeworks are not accepted except in the case of an unanticipated absence (e.g. serious illness, death in the family, loss of your favorite dvd etc.). Assignments will also be posted on my web page <http://www.math.wm.edu/~rrrkinc> and on the WM blackboard.

COMPUTING:

Some homeworks will require using programs (LINDO), but students will not be required to do any significant computer programming.

EXAMINATIONS:

There will be two exams (in October and November that I would like to schedule for a 1.5 hour time block) and a comprehensive final exam. The final exam is scheduled for Monday, December 14 from 9 a.m.–noon. All three exams will be “almost closed book,” i.e. students may use one (three for the final) 8.5 by 11 inch sheet of notes. Such notes may be on both sides of the paper, but they should be in original pen or pencil, **not photo-copies**. Makeup exams will be considered only in the case of unanticipated absences. Students who miss an exam for any other reason will receive a grade of zero.

GRADES:

Final grades will be based on four values: homework average, exam 1, exam 2, and the final exam. Homework average is the total number of points you have received on homeworks as a percent of the total possible. No grade is ever dropped. The four percent values will be weighted

Hmk Avg	25%
Exam 1	20%
Exam 2	20%
Final	35%

Final grades may be “curved” (in your favor). If the final grades are not curved then the following scale will apply

A	92% and above,
B	80–91%,
C	70–79%,
D	60–69%,
F	59% and below.