

**ISE 441/541: Introduction to Operations Research
Fall 2008**

Monday and Wednesday 2:10 pm – 4:00 pm Room 190 Stocker Center

Credit Hours: 4, **Call Number:** 04108/04122

Course Description:

Basic methodology of operations research. Applications and mathematical structure of linear models, linear, and integer programming.

Instructor:

Dr. Tao Yuan

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Office hours: 9:00 am – 11:00 am Monday and Wednesday or by appointment

Course webpage: <http://bb7pilot.ohio.edu/>

Textbook:

Wayne L. Winston, “*Operations Research: Applications and Algorithms*,” 4th Edition, Duxbury Press.

Course outcomes:

Upon the completion of ISE 441/541, students will be able to

1. Explain what a mathematical model is and what kinds of problems can be modeled in this way.
2. Distinguish between linear and nonlinear relations in various problems.
3. Distinguish between real and integer decision variables.
4. Formulate a mathematical programming problem with objective function, constraints and decision variables.
5. Graphically solve two decision variable models.
6. Use Microsoft Excel solver or equivalent software to obtain optimal solutions.
7. Apply the Simplex method.
8. Formulate transportation models and apply transportation simplex.
9. Apply basic branch-and-bound method on small problems.
10. Develop assignment models.
11. Describe heuristic search methods.

Course outline:

1. Introduction to linear programming (Chapters 1-3)
2. Simplex algorithm (Chapter 4)
3. Sensitivity analysis (Chapter 6)
4. Transportation and assignment problems (Chapter 7)
5. Integer programming, Branch & Bound (Chapter 9)
6. Software applications and other topics

Homework:

Homework problems will be assigned typically once a week. No late turn-in is accepted. Each student is expected to solve and submit problems individually. Students using the work of others without giving credit (plagiarism) will receive a failing grade in the course.

Exams:

You will have two midterm exam and a final exam (comprehensive). Midterm exams will be announced at least one week in advance. The final exam is schedule on Thursday, November 20, at 12:20 p.m. A student who misses an exam may make it up if prior permission is obtained from the instructor.

Project:

A project will be assigned. The project will involve developing mathematical models for some real problems, obtaining optimal solutions, performing sensitivity analysis, and interpreting the results. Details of the project will be announced after covering the simplex method.

Grading:

Homework assignments and quizzes	20%
Two in-class mid-term exams	40%
Project	15%
Final exam (comprehensive)	25%

Grading scale:

A	$\geq 93\%$	A-	$90 \sim < 93\%$		
B+	$87 \sim < 90\%$	B	$83 \sim < 87\%$	B-	$80 \sim < 83\%$
C+	$77 \sim < 80\%$	C	$73 \sim < 77\%$	C-	$70 \sim < 73\%$
D+	$67 \sim < 70\%$	D	$63 \sim < 67\%$	D-	$60 \sim < 63\%$
F	$< 60\%$				

Attendance policy:

Attendance will not be graded but strongly recommended. Students are responsible for all of the material covered in the class.

Intellectual copyright policy

The lectures, classroom activities, and all materials associated with this class and developed by the instructor are copyrighted in the name of Tao Yuan on September 8, 2008