

ESI 6314 Deterministic Methods in Operations Research

1. Catalog Description: (4 credit hours) Introduction to basic models and their solution with modern computer packages. Emphasis on modeling, computer solution, and sensitivity analysis with minimal reference to model theory and development of algorithmic methods.
2. Pre-requisites: Multi-variable calculus; Linear algebra or matrix theory; Basic PC experience with software.
3. Course Objectives: Upon completion of this course, students will obtain knowledge and skills to be able to deal with practical problems in the following areas:
 - a. Linear programming: model building, graphical solution of two-variable problems, simplex method, MS Excel Solver and LINDO software, duality and sensitivity analysis.
 - b. Network optimization: modeling different problem types in network optimization, transportation and assignment problems, maximum flow and shortest path problems and solution algorithms.
 - c. Model building and solving with branch and bound method in integer linear programming.
 - d. Model building and solution techniques' basics in nonlinear programming.
4. Contribution of course to meeting the professional component: N/A
5. Relationship of course to program outcomes: N/A

6. Instructor: Dr. Vladimir L. Boginski
 - a. Office location: REEF 152
 - b. Telephone: 850-833-9355 ext 240
 - c. E-mail address: vb@ufl.edu
 - d. Web site: www.reef.ufl.edu/faculty%20pages/boginski/boginski_home.htm
 - e. Office hours: TR 3:00-4:00 CT (4:00-5:00 ET)
7. Teaching Assistant: Kun Zhao
 - a. Office location: TBD
 - b. Telephone: TBD
 - c. E-mail address: zhaokunzk@ufl.edu
 - d. Office hours: TBD

8. Meeting Times: REEF Section: TR 4:00-6:00PM, REEF 110; Gainesville Section: T 4-5 period, NEB 102; R 1-2 period, NEB 201
9. Class/laboratory schedule: N/A
10. Meeting Location: REEF 110 (REEF section); NEB 102/NEB 201 (Gainesville section – see “Meeting Times”)
11. Material and Supply Fees: N/A
12. Textbooks and Software Required:
 - a. Title: Introduction to Mathematical Programming (includes a free CD with LINDO software)
 - b. Author: W. Winston and M. Venkataramanan
 - c. Publication date and edition: 4th edition, 2002, Duxbury Press
 - d. ISBN number: 0534359647

13. Recommended Reading: Instructor's slides and notes will be posted on the course website (login to lss.at.ufl.edu using your gatorlink ID and password).

14. Course Outline:

Linear programming

Formulations

Solution methods

Sensitivity Analysis

Network optimization

Network models

Transportation simplex method

Maximum flow and shortest path algorithms

Integer programming

Formulations

Branch-and-bound basics

Nonlinear optimization

Formulations

Unconstrained optimization

KKT conditions (time permitting)

15. Attendance and Expectations: REEF students are expected to attend the lectures in person. Since this is an EDGE course, attendance will not be recorded.

16. Grading: homework 30%, midterm exam 35%, final exam 35% (final exam is not cumulative).

17. Grading Scale: 90-100 A, 85-89 B+, 80-84 B, 75-79 C+, 70-74 C.

In order to graduate, graduate students must have an overall GPA and an upper-division GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

18. Make-up Exam Policy: Make-up exams can be granted only if a student provides a documented acceptable reason for not being able to attend a regularly scheduled exam. All make-up requests must be submitted to the instructor BEFORE the scheduled exam date. Tentative exam dates: midterm exam - **Tuesday Oct 18** (in class), final exam - **Monday Dec 12, 10:00am ET**. EDGE students will take the exams according to the standard procedure: the exam will be sent to your proctors on the exam date, and you will have *at least two business days* to complete the exam and have your proctor send it back to the instructor.

19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF

student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

21. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.