

Course Outline
Math 428/828, Spring 2010/11

Instructor: Steve Cohn

Office: Avery 226

Phone: 472-7223

Email: scohn1@math.unl.edu

Office Hours: Monday, Wednesday 2:30-3:20, Thursday 3:30-4:20, and by appointment.

Text: *Introduction to Operations Research*, eighth edition, by F. Hillier and G. Lieberman.

ACE Outcome: Math 428 satisfies ACE outcome 10: *Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation and reflection.*

Course Outline: We should try to cover these topics:

- Formulation of linear programming problems. (Sections **3.1, 3.2, 3.4, 3.5.**)
- Solution of linear programming problems by the simplex method. (Sections **4.1-4.7.**)
- The theory of the simplex method. (Sections **5.2, 5.3.**)
- Duality and sensitivity analysis for the simplex method. (Sections **6.1-6.8.**)
- Dynamic programming. (Sections **10.1-10.4.**)
- Decision theory. (Sections **15.1-15.4.**)
- Queueing theory. (Sections **17.1-17.6.**)

In the unlikely event that we have time left over, we could also take a look at one of these:

- Integer programming. (Sections **11.1-1.4.**)
- Game theory. (Sections **14.1-14.5.**)
- Markov processes. (Sections **16.1-16.8.**)
- Simulation. (Sections **20.1-20.6.**)

Background: You'll need calculus, linear algebra and basic probability. You don't need programming experience.

Course Log: You can find the course log on Blackboard. If you miss class, you can check the log to find which topics and sections were covered, which problems assigned, etc.

Homework: Homework will be assigned weekly. A well-written solution to a homework problem will earn you up to three points. You'll get one point for the writing and zero, one or two points for the mathematics. A poorly-written solution earns you one point at most. You get the point if the answer is correct and accompanied by sufficient work.

Exams: We'll have two 75-minute exams and a two-hour comprehensive final. The probable dates of the exams are *February 23* and *April 12*. The final will be given *1:00-3:00 PM, Monday, May 2*. Books and notes are not allowed on exams. You may use a simple scientific calculator on an exam, but not graphing calculators, cell-phone calculators or calculators that support a computer algebra system (e.g. Maple).

Project: There will be a project, possibly broken into up into two parts. You may do the project alone, or in group of no more than three.

Grades: Each 75-minute test will count for 20% of your grade, the final exam 30%, the project and homework 15% each.