

Math 428/828 Course Outline

Instructor: Steve Cohn (Avery 226, scohn@unl.edu)

Text: *Introduction to Operations Research*, 9th Edition, by F. Hillier and G. Lieberman. (**Note:** This book and the solutions manual is available at various sites as a free pdf file. You can also find inexpensive used hardcover copies. You do **not** need the additional online material that comes with new copies.)

Office Hours: Monday 2:30-3:20, Thursday 10:00-10:50 and by appointment.

Time and Place: 12:30-1:20 pm, Monday, Wednesday and Friday, in Avery 119.

Prerequisites: The nominal prerequisites are Math 314 and Math/Stat 380. To follow the lectures, you'll need calculus, linear algebra and basic probability.

Course Log: This is a daily course log in the Canvas/Files folder. If you miss class, you can check the update to find which topics and sections were covered, announcements, changes to the syllabus, etc.

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. The scholarly product will consist of oral and written group project reports. Your instructor will provide you with background material and guidance when needed.

UNL Covid Policies and Updates can be found [here](#).

UNL Policies and Resources for

- Attendance,
- Academic Honesty,
- Services for Students with Disabilities,
- Mental Health and Well-Being,
- Final Exams (15th Week),
- On Campus Emergency Procedures,
- Diversity and Inclusiveness,
- Title IX,

can be found [here](#).

Special Dates: Some dates to bear in mind are:

- The last day to file a drop to remove a full semester course from student's record is **January 28**.
- The last day to change your grade option to or from **Pass/No Pass** is **March 11**. If you choose the Pass/No Pass grading option, you need to earn a C or better in order to pass.
- The last day to **withdraw** from the course is **April 15**.

You can find more detail [here](#).

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You'll be notified when the form is made available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Course Outline: We'll try to cover all or part the following topics and sections:

- Formulation of Linear Programs: Sections **3.1, 3.2, 3.4, 3.5**
- Solution of Linear Programs: Sections **4.1-4.7**
- Theory of the Simplex Method: Sections **5.1-5.3**
- Duality, Sensitivity Analysis and the Simplex Method: Sections **6.1-6.5**
- Dynamic Programming: Sections **10.1-10.4**
- Queueing Theory: Sections **17.1-17.6**

Additional Material: In the unlikely event that we have time left over, we will choose additional material from these sections:

- Integer Programming: Sections **12.1-12.5**
- Inventory Theory: Sections **18.1-18.6**
- Decision Analysis: Sections **16.1-16.4**
- Simulation: Sections **20.1-20.5**

Math 828 Students in 828 will be graded on the same as those in 428, but should expect longer and more demanding exams and homework and project assignments.

Project: There will be a project, possibly broken into up into two or more parts. You may work on the project alone or in a group of at most three students.

Midterms: We'll have three 100-point midterms. The tentative dates are **February 23, March 23** and **April 27**. The tests will be given in class. Exam problems will be based *mostly* on the homework, lectures and assigned reading.

Final Exam: A 200-point, comprehensive final exam will be given **3:30 - 5:30 PM on Monday, May 9.** Students are expected to arrange their personal and work schedule to allow them to take the final exam at the scheduled time. No student will be permitted to take the final exam early.

Missed Exams: If you must miss a midterm because of UNL-mandated activities, injury or illness, you may be allowed to make it up. The rules governing makeups are:

- You must provide documentation.
- A request to make up a midterm can be made no later than 10:00 am on the day of the midterm.
- A missed exam that is not made up receives a score of zero.
- The foregoing rules may be suspended in the event of an emergency or extended crisis or illness.

Calculators: You may use a simple scientific calculator during an exam, but nothing else. In particular you **may not** use a graphing or programmable calculator, or any internet-enabled device. This includes smart phones and smart watches. For homework and the project, you may use any software and any device.

Homework: The facts and policies are:

- Homework will be assigned regularly. You are responsible for all assigned problems, though only a few in each week will be collected for grading. Exam problems will be based mostly on the homework.
- There are free **solutions manuals** in pdf form available online, as well as inexpensive paper copies. Even if you take a solution from a such a written source, I urge you to work the problem yourself. That is the best way to learn the material and prepare for exams.
- To receive full credit for a homework problem, you must have a correct, **clearly written** solution that is supported by appropriate work. A poorly written solution earns you one point at most. The point will be awarded if the answer is correct and supported by sufficient work.
- Late homework will not be accepted.
- You may be excused from a homework assignment because of illness, injury, some personal or family crisis, etc. I may ask for documentation.

Semester Grades: Your semester grade depends on your three midterms, the final, the project and the homework.

Activity	Value
Midterms	300
Final Exam	200
Project	100
Homework	100
Total	700

Letter grades correspond to percentages as follows:

Percentage	96	90	88	86	80	78	76	70	68	66	60	58
Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

Grading Appeals: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals in order, to: their instructor; the Chair of the Mathematics Department; the Mathematics Department grading appeals committee; and lastly, the College grading appeals committee.