STOR 415 - Introduction to Optimization (Fall 2019)

Time and space

12:20 - 1:10PM, Monday - Wednesday - Friday   Gardner 105

Staff

Instructor: Shu Lu (shulu@unc.edu)
Office hours: Wed 1:20PM – 2:20PM, Friday 10:00AM – 11:00AM at Hanes 355

Instructional Assistant (IA):   Younghoon Kim (yhkim0225@unc.edu)
Office hour: Thursday 9:30AM-10:30AM at Hanes B4

Textbook

The manuscript *Introduction to Optimization* by Lu and Tran-Dinh posted on the course website. At the beginning of the semester only the first few chapters are posted; more chapters will be posted as the semester continues.

References

- Introduction to Mathematical Programming: Operations Research, Volume 1 (4th Edition) by W. L. Winston and M. Venkataramanan.

- Introduction to Operations Research, 8th Edition, by F. S. Hillier and G. J. Lieberman.

- Linear Programming with MATLAB, by M. C. Ferris, O. L. Mangasarian and S. J. Wright.

Syllabus

> Introduction to linear programming
> A review of linear algebra and linear equations
> Forms of linear programming problems
> Basic solutions and basic feasible solutions
> The simplex method (phase II)
> The two-phase simplex method
> Duality
> Sensitivity analysis of linear programming
> Introduction to GAMS
> The blending problem
> The inventory problem
> The transportation problem
> The minimum cost network flow problem
> Introduction to integer programming
> Basics in nonlinear programming

Class attendance and course website

Students are expected to attend all classes. You are responsible for material covered and announcements made in class, whether or not you are in class.

A course website is available at https://sakai.unc.edu/. Once you log in with your ONYEN and password, go to the course site entitled STOR415.001.FA19. We will use it for posting handouts, assigning homework, posting grades, making announcements, and for other purposes. Please check the website regularly; you are responsible for any material distributed electronically by email or via the Web.

Homework

Homework will be assigned in most weeks. It will be posted on the "Assignments" page at the course site. It will be due on dates stated online; it will be graded and the grades returned to you, usually within one week.

To receive credit on homework, you need to turn it in at the beginning of class on the due date, or deposit it in the grader's mailbox at Hanes 310 before 12:20PM on the due date. Do not deposit homework in the Instructor's mailbox or the Instructor's office. Unless specifically approved by the instructor, homework will not be accepted via email or other electronic forms. In general, late homework will receive no credit. Occasionally, reasonable exceptions may be made, with the instructor's specific approval in each case. Verbatim copying of homework is absolutely forbidden and constitutes a violation of the Honor Code.

To receive full credit on homework, you must:

- show all work neatly, write in blue or black pen or pencil, with your name on every page;
- clearly label each problem;
- staple the entire assignment together in the correct order.

Points can be deducted for disorganized homework. Students who believe their grade on an assignment or examination is in error can request adjustment of the grade during a period of three weeks after the due date of the item in question. The three-week period will be shortened for the last one or two assignments of the semester. Any questions regarding homework grades should first be taken up with the IA; if these questions cannot be resolved with the IA, then feel free to discuss them with the Instructor.

Software

- GAMS. The use of this modeling language will be required in the second half of this semester. You can find information or download a free student version at https://www.gams.com; however, all class examples and homework assignments about GAMS will be completed on a notebook server that provides an interface for GAMS/Jupyter notebooks. More details will be provided in due course.

Exams

There will be two in-class examinations (50 minutes) scheduled on Friday 27 Sep and Friday 1 Nov, and a final examination (three-hour long) at 12:00 PM on Friday 13 Dec. Any questions regarding exam grades should be taken up with the Instructor.

Course Grade

A student's numerical grade will be based on the final course average, in computing which the graded work will be weighted as follows: regular homework assignments, 25%; in-class examination, 20% each; final exam 35%. The worst homework grade will be dropped when computing the final course average. Letter grades will be assigned based on numerical grades.

- All questions about course registration and the waitlists should be directed to
  Ms. Christine Keat (mailto: c_keat@unc.edu, Hanes 321, 919-962-2307).
- Each student is responsible for verifying his or her recorded scores (homework, quizzes, in-class exams) during the semester.
- The Honor Code will be observed at all times in this course. The terms of the Honor Code are set out at http://instrument.unc.edu.