
Office hours: (Tentative) Tuesday 12-1, Wednesday 10-12. You may also stop by whenever you have a question. I also welcome questions by email or by phone.

Grader: Qi Fan qi.fan.1@stonybrook.edu office hours Tuesday 4-6, Harriman 027.

Lectures: Tuesday, Thursday 2:30-3:50, ESS 183.

Prerequisites: A course in linear algebra.

Required Text(s): One of: Linear Programming and Network Flows, by Bazaraa, Jarvis, and Sherali (any edition), or, Linear Programming, by Ignizio and Cavalier.

Recommended Texts: Linear Programming, by Chvátal, Linear Programming and Related Problems, by Nering and Tucker, Linear Programming, by K.G. Murty, Linear Programming and Extensions, by Dantzig, and Linear Programming, by H. Karloff, to name but a few of the many books on the subject.

Homeworks: You may discuss homework problems with other students taking the course, and with the instructor. But the work that you turn in should always be your own write-up. You should not look for solutions online, or get them from students in previous years. This is considered academic dishonesty! I usually do not accept late homework, unless you have a very good reason. I will drop the lowest homework score before computing your average.

Homework cover sheet: Each homework must have a cover sheet (available on blackboard) which should be filled out and stapled to the homework. Homeworks turned in without a cover sheet will not be graded.

Grading: 35% homework, 30% midterm (tentatively, Thursday October 19 in class), 35% final (Monday December 18, 11:15-1:45). All tests are closed notes, however you may bring 1 page of summary notes.

Learning outcomes:
1) Learn to formulate optimization problems as linear programs.
2) Develop skill in using linear programming software, including Lindo/AMPL.
3) Understand theory from linear algebra and convex analysis that applies to the theory of linear programming.
4) Learn the simplex algorithm and use it to solve linear programs:
   • Putting linear programs in standard form with slack and excess variables;
   • Finding an initial basic feasible solution (using big M or two-phase simplex for min problems);
   • Choosing which variable enters and which variable leaves the basis;
   • Handling unbounded and infeasible problems;
   • Analyzing convergence in nondegenerate programs;
   • Analyzing convergence and methods in degenerate programs, including Bland’s pivot rule, perturbation, and lexicographical methods.
5) Understand and apply principles of duality:
   • Defining dual programs;
   • Developing duality theorems;
   • Applying the dual simplex algorithm.
6) Apply sensitivity analysis to solutions of linear programs:
   • Shadow prices and reduced costs;
   • Range for objective function coefficients and right-hand sides;
   • Connections to the dual linear programs and complementary slackness.

7) Learn and use special forms of the simplex method:
   • Transportation problems;
   • Transshipment problems;
   • Assignment problems;
   • Network simplex method.

8) Other recent algorithms for linear programming:
   • Ellipsoid algorithm;
   • Karmarkar and related interior-point methods.

Computing: It will be helpful for every student to have access to some LP solver. There are many (free or student versions) options, see links on the course web page to a few of them (NEOS, AMPL, Lindo).

Disability Policy: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following website: http://www.ehs.sunysb.edu/fire/disabilities.asp

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

The University at Stony Brook expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people. Faculty is required to report disruptive behavior that interrupts faculty’s ability to teach, the safety of the learning environment, and/or students’ ability to learn to Judicial Affairs.