Course Description
(3 units) Survey of methods including network flows, integer programming, nonlinear programming and dynamic programming. Models development and solution algorithms are covered.

Course Objective
Students are able to develop a working knowledge of different types of optimization methods in these directions: learning solution approaches for linear/integer/dynamic/nonlinear programming and some network optimization problems; developing an appropriate optimization model from a verbal description of a problem; choosing an appropriate solution technique; extract relevant information from the model and solutions.

Prerequisites

Time and Location: TuTh 12:30PM-1:45PM, ENGR 301
Instructor: Dr. Neng Fan
Office: ENGR 312
Office Hours: TuTh 3:30PM-4:30PM or by appointment
Email: nfan@arizona.edu

Teaching Assistant
Masoud Eshghali
Office: ENGR 306
Office Hours: MoWe 4:00PM-5:00PM or by appointment
Email: masoudeshghali@email.arizona.edu

Course Website
We'll be using D2L. All class materials, including homework assignments, lecture notes, supplemental readings, videos, etc., will be distributed from D2L. You must check the announcements in D2L at least twice a week.
References

OR

Course Outline
2. Network optimization: terminology, shortest path problem, minimum spanning tree problem, maximum flow problem, minimum cost flow problem, network simplex method
3. Integer programming: modeling with integer variables and binary variables, branch-and-bound algorithm, cutting plane algorithm
4. Nonlinear programming: review of differential calculus, types of nonlinear programming, convexity of functions, one-variable and unconstrained optimization, convex programming
5. Dynamic programming: examples, solution procedure

Course Policies
SIE 440:
Homework: 5 sets (30%); Exams: Midterm exam (30%), Final exam (40%)

SIE 540:
Homework: 5 sets (20%); Exams: Midterm exam (25%), Final exam (35%); Project (20%)

I expect you to understand and write your own solutions, but you are allowed to discuss with your classmates. Also, if you have any references, you must cite them. Late problem sets will not be accepted unless you contact the instructor in advance. Any questions with grades for homework and exam, you should write explanation to teaching assistant/instructor within one week of grades posted.

Accessibility and Accommodations: At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, https://drc.arizona.edu) to establish reasonable accommodations.

You are encouraged to make recommendations to improve the class and my teaching skills. Information contained in the course syllabus, other than the grade policy, may be subject to change with advance notice, as deemed appropriate by the instructor.