

**COURSE DESCRIPTION**  
**INTRODUCTION TO OPTIMIZATION**  
**MA 4/566-2D**  
**SPRING 2020**

DEPARTMENT OF MATHEMATICS  
UNIVERSITY OF ALABAMA AT BIRMINGHAM

**Course Instructor:** Professor Nikita Selinger  
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**Office Hours:** By appointment

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**Meeting times:** TuTh, 12:30 – 13:45  
**Meeting location:** HHB 221  
**Textbook:** *An Introduction to Optimization* 4th Edition by E. Chong and S. Zak.

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**Course Description**

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Optimization is important in many decision making problems in various areas like engineering, economics and machine learning. Optimization theory deals with finding the *best* solution(s) or variables of a given objective function. Recently, the area of optimization has received much attention due to the development of highly efficient computational methods for data analysis. The scope of this course covers linear algebra, unconstrained optimization, linear programming, and nonlinear constrained optimization. The course will also introduce optimization algorithms and codes via python and/or matlab.

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**Course Keywords**

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linear algebra, linear program, duality, network flows, simplex method, non-simplex method, quadratic program, gradient methods, conjugate methods, neural network, genetic algorithm, convex optimization

### Objectives of the Course

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Upon successful completion of the course, a student

- (1) develops and implements algorithms from a given optimization problem;
  - (2) implement optimization methods to solve decision making problems;
  - (3) learns the basic principles of optimization theory
  - (4) integrates real datasets in the algorithms
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### Course policies:

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- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers. Various services to assist you are also listed in the *Student Resources* section of the *Blazernet* web site.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.
- If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the properly rescaled final exam score. If you miss the final exam you will receive a zero score for this exam. In all cases you **must** contact your instructor of such circumstances **before** the exam takes place.