

COURSE DESCRIPTION

INTRO TO OPTIMIZATION

MA 466-2D

SPRING 2024

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Carmeliza Navasca

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Preferred Methods of Contact: Email is the preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays and a slower response on weekends (OR Emails received after 5 pm on Friday will be returned Monday morning). Include course number in the subject line of your email for a faster response. I am also available to meet with you virtually via Zoom by appointment only. Otherwise, I will have in-person meetings during my scheduled office hours.

Office Hours: TBA

Course Info

Meeting times: TTH, 12:30 PM - 1:45 PM

Meeting location: HHB 221

Required Textbook: (1) *An Introduction to Optimization* 4th Edition by E. Chong and S. Zak. (2nd edition, <https://www.gipsa-lab.grenoble-inp.fr/~ahmad.hably/Documents/IntroOptimization.pdf>)

Recommended Textbook: (1) *Foundation and Analysis of Linear Programs* by B. Van Roy and K. Mason, SIAM, 2016, (<https://web.stanford.edu/class/engr62/notes/notes.pdf>)
(2) *Convex Optimization* by Steven Boyd and Lieven Vandenberghe, Cambridge University Press, (<https://web.stanford.edu/~boyd/cvxbook/>)

Important Dates

First day of our class: January 9, 2024

MLKJr Holiday: January 15, 2024

Last day to drop without paying full tuition: January 16, 2024

Spring Break: March 10 – March 16, 2024

Last day of our class: April 18, 2024

Quiz Dates: January 31, 2024, February 28, 2024, April 3, 2024

Midterm Date: March 19, 2024

Final Exam Date: Friday, April 25, 2024

Course Policies

- Please make sure that you are able to receive e-mail through your Blazer-ID account.
- If you are contacted by the Early Alert Program, you should consider taking advantage of the services it offers.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at dss@uab.edu.

Course Description

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 matlab.

Class Management via Canvas

- Homework problems will be posted in canvas (<http://www.uab.edu/online/canvas>). Other class materials (class announcements, codes, grades and etc.) will be posted in canvas. Students should log in to canvas at least once a day! (I prefer to receive emails via canvas.)
- Homework assignments, projects and activities will only be collected on canvas.

Assessment Procedures

- Student achievement will be assessed by the following measures:
 - **Weekly homework.** Homework will be due weekly. There will be no extension of deadlines for any reason. Homework contributes 30% to the course average.
 - **Project.** The project contributes 30% to the course average. There will be two projects.
 - **Midterm exam.** There will be one midterm exam. The midterm exam contributes 10% to the course average.
 - **Final exam.** The final exam or project contributes 30% to the course average.

Grading Scheme: 30% homework, 10% midterm exam, 30% project, 30% final exam

- Your final grade is determined according to the following table:

Course performance:	88-100	75-87	62-74	50-61	below 50
Final Grade:	A	B	C	D	F

UAB Policies and Resources

- Non-Academic Student Code of Conduct (<https://www.uab.edu/students/conduct/>)
- DSS Accessibility Statement
 Accessible Learning: UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an

interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) 934-4205, visit (<https://www.uab.edu/students/disability/>), or their office located in Hill Student Center Suite 409.

- Title IX Statement

The University of Alabama at Birmingham's committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit (<https://www.uab.edu/titleix/>) for UAB's Title IX, UAB's Equal Opportunity, Anti-Harassment, Duty to Report, and Non-Retaliation policies.

Academic Honor Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation. Candidates are expected to honor the UAB Academic Honor Code as detailed in the most current UAB Student Catalog. Please consult this resource (<https://www.uab.edu/one-stop/policies/academic-integrity-code>) for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Honor Code.

Non-harassment, Hostile Work/Class Environment

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty, and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee.
