SYLLABUS
INTRODUCTION TO OPTIMIZATION
MA 496/596
SPRING 2019

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Carmeliza Navasca
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Phone: (205) 934-8621
Office Hours: Mon Wed 10:15-11:45am (or by appt)

Course Info

Meeting times: TueThu 12:30-1:45 PM
Meeting location: HHB 221
Prerequisite: Grade of C or better in MA 126 or equivalent. Any student who has not fulfilled
the prerequisite will be dropped from the class.
Credits: 3 semester hours
Recommended Textbook: Foundation and Analysis of Linear Programs by B. Van Roy
and K. Mason, SIAM, 2016

Important Dates

First day of our class: January 8, 2019
Martin Luther King Holiday: January 21, 2019
Last day to drop without paying full tuition: January 14, 2019
Spring Break: March 11–17, 2019
Last day to withdraw: March 1, 2019
Last day of our class: April 19, 2019
Midterm Date: Feb 14, 2019
Final Exam Date: Thursday, April 25, 2019

Course Policies

• Please make sure that you are able to receive e-mail through your Blazer-ID account.
• If your 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

Date: January 8, 2019.
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.

Course Keywords

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

Objectives of the Course

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

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 three times a week! (I prefer to receive emails via canvas.)
- I will NOT collect your homework during class. Homework assignments will be uploaded in canvas before the due date.

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 20% to the course average
  - **Midterm exam.** The midterm exam contributes 20% to the course average.
  - **Final exam.** The final exam contributes 30% to the course average.
Note that extra homework and project assignments will be given to students enrolled in math 596

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

<table>
<thead>
<tr>
<th>Course performance:</th>
<th>88-100</th>
<th>75-87</th>
<th>62-74</th>
<th>50-61</th>
<th>below 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Grade:</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

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/students/one-stop/policies/academic-honor-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.