STA 6275, Fall 2022

Optimization

Course Instructor

Z. Su, 207 Griffin-Floyd Hall (352-273-2993)
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Office Hours: T: 2:00 PM - 3:00 PM, R: 2:00 PM - 3:00 PM, 207 Griffin-Floyd Hall.

Teaching Assistant

Yu Zheng
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Office Hours: W: 2:30 PM – 4:30 PM, 115A Griffin-Floyd Hall.

Lectures

T: 11:45 AM - 1:40 PM, R: 12:50 PM - 1:40 PM.

Reference Books

Numerical Optimization by J. Nocedal and S. J. Wright.

Convex Optimization by S. Boyd and L. Vandenberghe.

Course Website

Canvas

Please check this site regularly. Most course documents and important information, including suggested homework exercises and readings, course schedule, practice session schedules, and special announcements, will be posted there.

Course Description

This course aims to build a foundation for numerical optimization at both algorithmic and theoretical levels, such that students are prepared to apply the appropriate optimization algorithm to a practical problem, implement the the numerical optimization approaches in `R`, and read literature on optimization. Topics included are, but not limited to, convex sets and functions, necessary and sufficient conditions for convergence, gradient descent, subgradient method, stochastic gradient descent, proximal gradient descent, Newton method, quasi-Newton methods, proximal Newton method, conjugate gradient methods, Nelder-Mead method, coordinate descent, constrained optimization and KKT conditions, linear programming and simplex methods, dual ascent, and penalty and augmented Lagrangian methods. `R` will be the primary computing platform for this course.

Homework

Homework problems are assigned weekly or biweekly. Late homework without legitimate documented reason will not be accepted. If you cannot hand in your homework during the lecture, please talk to the Teaching Assistant. All homework must be readable. `R` codes should be included in computing problems. Working together in groups on homework is permitted, but each student must do his/her own write-up of the solutions in his/her own words. Directly copying is not acceptable. Answers to selected exercises can be found on the course website.

Exam

The final exam will be 5pm - 8pm on Dec 13. No make-up exam is available.

Grading

Base grade: An average score of 90% or above of the homework guarantees a base grade of B+, 85% to 89% guarantees a B, 80% to 84% for a B-, 75% to 79% for a C+, 70% to 74% for a C, 65% to 69% for a C-, etc.

Final grade: A score of 85% or above of the final exam raises the base grade by 2 scales, e.g. from B+ to A, or B to A-, or B- to B+, etc. A score of 70% to 84% of the final exam raises the base grade by 1 scale, e.g. from B+ to A-, or B to B+, or B- to B, etc. A score of 69% or below does not raise the base base, in which case, the final grade equals the base grade.

Attendance

The course is challenging and requires steady effort throughout the semester. You are expected to attend all lectures and hand in your assignments on time. You are responsible for making up for any missed lectures.

Incompletes

Grades of "I" will be given only in extraordinary circumstances, and then only by written agreement between the instructor and the student.

Reasonable Accommodations

To request classroom accommodation, please be certain that you have made all necessary arrangements with the Dean of Students Office, and obtain from them documentation to submit to the instructor at the time of your request. A request must be made to the instructor at least one week in advance of the date for which the accommodation is requested. This course information and policies sheet can be made available in alternative formats to accommodate print-related disabilities. Contact the instructor for more information.

Academic Integrity

Please familiarize yourself with the Student Honor Code and Academic Honesty Guidelines outlined in your University of Florida Student Guide and at
http://www.dso.ufl.edu/studentguide/studentrights.php.

Disability access statement

This material is available in alternative formats upon request.