Optimization
Math 4211/6211
Fall 20XX

Description: Lagrange multipliers, gradient methods (steepest descent), search techniques, variational methods and control problems; varying other topics such as dynamic programming, nonlinear programming.


Prerequisite: Either MATH 3030 or both MATH 2641 and MATH 2215 with grades of C or higher and the ability to program in a high level language.

Grade weighting: 25% Final exam
20% first exam
20% second exam
15% Quizzes
20% Graded Homeworks/Projects

Grade scale: [97, 100] A+
[93, 97) A
[90, 93) A-
[87, 90) B+
[83, 87) B
[80, 83) B-
[77, 80) C+
[70, 77) C
[60, 70) D
[0, 60) F

Makeup Policy: Exams may be made up only in the event of a suitable verifiable excuse (e.g., a doctor’s note is necessary). Absence from the final exam will result in a grade of F for the course unless arrangements are made PRIOR (at least 2 weeks) to its administration. No make-ups will be scheduled for quizzes. To allow for unavoidable circumstances that might force you to miss a quiz, your lowest quiz score will be dropped when your final grade is computed.

Cheating/Plagiarism: Cheating/plagiarism will not be tolerated on any work. A first occurrence will result in a grade of 0 on the assignment, quiz, or exam for all involved students as well as an academic dishonesty form being filed. A second occurrence will result in a grade of F for the course for all involved students and a second academic dishonesty form being filed. See the University’s policy on academic honesty at:

http://codeofconduct.gsu.edu/
University Closures: If the University is closed due to weather or for any other reason, any exam or quiz that may have been scheduled for that date will be administered on the next available class date. If a homework is due that day, it will be due the next class.

Notes: This syllabus provides a general plan for the course; deviations may be necessary.

Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.

Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Learning Outcomes:

- Students will understand and apply necessary and sufficient conditions for maxima and minima of functions of multiple variables.
- Students will be able to apply line search strategies such as golden section search.
- Students will be able to apply common iterative algorithms for continuous unconstrained optimization and understand their convergence properties.
- Students will be able to formulate and identify linear programming problems in standard form and solve such problems using the simplex method.
- Students will be able to use the algorithms studied in the context of chosen application areas such as training of neural networks, control problems, or scheduling problems.
- Students will be able to apply the Lagrange and KKT conditions to identify local maxima and minima of constrained optimization problems.