MATH 651: Optimization I

Lecturer:	Prof. Wolfgang Bangerth
	Blocker Bldg., Room 507D
	(979) 845 6393
	bangerth@math.tamu.edu
Office hours:	Wednesdays, 10:00–11:45am
Lecture:	Tuesdays + Thursdays, 9:35–10:50am
	Blocker 628

Course Outline

Since MATH 651 (Optimization I) and MATH 652 (Optimization II) form a sequence, let me present a list of topics for both courses at the same time:

MATH 651	MATH 652
Examples of optimization problems and their solutions	Large-scale problems and PDE optimization
Optimality conditions for unconstrained nonlinear problems	Global search techniques for problems with many minima
Algorithms for unconstrained nonlinear problems	Linear and integer programming
Algorithms for unconstrained non-smooth problems, derivative-free algorithms	Optimal control
	Optimization with complex objective functions: optimization under uncertainty, optimal design, optimization for stability
Optimality conditions for constrained nonlinear problems	
Algorithms for constrained problems	Infinite dimensional optimization

Additional topics may be added at the descretion of the instructor. Topics may also be moved from MATH 651 to MATH 652 or the other way around as time permits.

Textbook

J. Nocedal and S. J. Wright: Numerical Optimization, 2nd edition, 2006, Springer

D. G. Luenberger: Optimization by Vector Space Methods, 1997, Wiley Interscience.

Prerequisites

Basics of programming, analysis. MATH 417 or MATH 609 are very helpful.

Webpage

Homework assignments and other course information will be posted on
http://www.math.tamu.edu/~bangerth/teaching.html

Exams + Grading

Final course grades will be computed from homework and programming assignments (50%) and exams (50%).

One midterm exam on 10/27/2009 (20%) and one comprehensive final exam 12/11/2009 (30%). We can discuss if the final exam should be replaced (possibly in part) by project work or a take-home exam.

Make-up exams: Students must make arrangements in advance if they will not be handing in homework on time or will miss an exam. Absences due to recognized University-related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis, but require a written excuse. Please let Dr. Bangerth know about this as soon as possible, and preferably in advance.

Incompletes: I will consider giving an incomplete if you have successfully completed all but a small portion of the work of the course, and are prevented from completing the course by a severe, unexpected event. Simply being behind work is not a reason for an Incomplete, though; in that case you should consider dropping the course.

S/U grades: If you are registered S/U your grade will be 'S' if your letter grade is C or above, and 'U' otherwise.

Policies

Academic integrity: The usual rules of academic intregrity apply. In particular, the Aggie Honor Code "An Aggie does not lie, cheat or steal, or tolerate those who do" should be selfevident, see

> http://www.tamu.edu/aggiehonor.html

Students may, and are encouraged to, work together and discuss homework problems with each other. However, copying work done by others is an act of scholastic dishonesty and will be persecuted to the full extent allowed by University policy.

Disabilities: If you have a disability and need special assistance, please contact me so we can make accomodations. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accomodation of their disabilities. If you believe you have a disability requiring an accomodation, please also contact Services for Students with Disabilities, Koldus 126, 845-1637.

For other policies and other information, please read

> http://www.math.tamu.edu/teaching/operationspg.html