

ECE 893, Sec. 005---Optimization and Adaptive Algorithms

Spring 2004

Meeting time: 9:30-10:45 a.m. TTh

Meeting location: Lowry 315

Dan Noneaker

305 EIB, 656-0100

danno@ces.clemson.edu

Office hours: by appointment

Purpose of course: ECE 893 addresses the theory of optimization from the perspective of vector spaces. It includes adaptive algorithms based on gradient-search methods and their application in the context of communication systems.

Outline: (approximate)

- i.) *Normed linear spaces:* (2.5 weeks)
- ii.) *Hilbert spaces and the projection theorem:* (1.5 weeks)
- iii.) *Dual Spaces, the Hahn-Banach Theorem, and Minimum-Norm Problems:* (2.5 weeks)
- iv.) *Linear Operators and Adjoint:* (1.0 weeks)
- v.) *Local Theory of Unconstrained Optimization:* (1.5 weeks)
- vi.) *Global Theory of Unconstrained Optimization:* (1.5 weeks)
- vii.) *Constrained Optimization:* (1.5 weeks)
- viii.) *Iterative Methods of Optimization:* (2.5 weeks)
- ix.) *Mid-term Exam:* (0.5 weeks)

Prerequisite: ECE 819.

Grading: 30% homework, 30% mid-term exam, 40% final exam

Text:

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

References:

D. G. Luenberger, *Linear and Nonlinear Programming*, Addison-Wesley, 1984.

Others as needed.

(the references will be available as needed at the library reserve desk)

Attendance, Class meetings: Regular class attendance is strongly recommended.

Every attempt will be made to announce class cancellations in advance. A time for make-up lectures will be determined.

Exam policy: Make-ups for a missed exam will only be allowed for urgent reasons. Make-up exams must be requested and taken before the scheduled exam date, except in extenuating circumstances.

Homework policy: Collaboration with your classmates on homework assignments IS allowed. However, each student must develop and write up each homework solution. No copying of solutions from others is allowed, even if the solutions are obtained as a result of collaboration.