Math 564—Nonlinear Optimization I
Fall 2007
M, W, F 11:10 a.m.–12:00 noon; Neill 3W
Please note that this document has two pages.

Instructor:

Name: K. A. Ariyawansa

Office: Neill 225

Office Hours: M, W, Th 1:10–2:00 p.m.

Telephone: 335-3152

E-mail: ari@wsu.edu

URL: http://www.wsu.edu/∼ari (includes a link to the course web page)

Outline of course:

The course will be on computational algorithms for unconstrained nonlinear optimization problems. Math 565, to be offered in Spring 2008, will build upon the material treated in this course and cover computational algorithms for constrained nonlinear optimization.

We will use the textbook

Numerical Optimization
Second Edition
J. Nocedal and S. J. Wright
Springer-Verlag, 2006.

The specific topics to be covered include the following. These are treated in Chapters 1–9 and 12, and Appendix A of the textbook.

(a) Introduction including some motivating applications.
(b) Brief review of material from analysis and linear algebra.
(c) Fundamentals of unconstrained optimization.
(d) Line search methods.
(e) Trust region methods.
(f) Conjugate gradient methods.
(g) Quasi Newton methods.
(h) Calculating derivatives.

(i) Derivative free optimization.

(j) An introduction to the theory of constrained optimization.

Grades:

The course grades will be based on homework assignments and on a term paper weighted as follows.

(a) Homework assignments—75%

(b) Term paper—25%

The term paper should be a clear and precise presentation of *independent* work performed during the semester on a regular basis on a project that would be decided on an individual basis by the student and the instructor. The following deadlines apply for the term paper. By September 14, 2007 a topic and the scope of the term paper should be finalized. *Term papers are due no later than 12:00 noon, December 10, 2007 in my mailbox in Neill 103.* At regular points in time I would like you to update me on the progress you are making on your work for the term paper.

Since there are no examinations, the degree of originality I expect in your work on the preparation of the term paper, as well as in your responses to homework assignments would be higher than that in a course with examinations. My grading will reflect this. Therefore, I would strongly encourage you to begin working on homework assignments and the term paper early, and to see me regarding questions and concerns without waiting until just before the deadlines. In particular, it probably would not be possible to prepare a term paper of the quality that I expect without careful planning and regular work from the beginning of the semester.

I expect individual work both in the project leading to the term paper, and in the preparation of solutions to assignment problems.