Numerical Analysis – Spring 2011 (15-MATH-516-001)

Time and Place: MWF 12:00-12:50 PM, 804 Old Chemistry.
Instructor: Donald A. French (611C Old Chemistry).
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Office Hours: M 1:30-3:30 PM (and by appointment).

Prerequisites: *Calculus I-IV*, *Differential Equations*, *Linear Algebra*, experience in programming (we may use MATLAB), *maturity/skill in mathematics at an advanced level* (It would be wise to have taken Analysis (e.g. 15-MATH-408/409), a *numerical analysis course* (You should be especially familiar with Taylor's Theorem, polynomial interpolation, orthogonal polynomials and the Weierstrass Theorem —Numerical Analysis I (15-MATH-514) would be best here.) and be concurrently taking Graduate Analysis (e.g. 15-Math-504/505/506)). .

Text: *Introduction to Numerical Analysis* (2nd edition) by Kendall E. Atkinson.

Description: This is the third quarter of a year long sequence on numerical analysis at the graduate level in mathematics. In this quarter we will cover chapters 5 and 6 of the textbook. The numerical approximation of definite integrals is the first topic which leads naturally into the second, a survey of computational schemes for ordinary differential equations. The primary focus of this course is the development of analysis skills in the context of numerical methods. Key concepts include convergence, accuracy, conditioning, and stability.

Grading: There will be two exams,

> Midterm: Wednesday, May 4, 2011 (In Class)
> Final: Tuesday, June 7, 2011 (Noon-2:00 PM)

which will count toward most of the course grade. Homework assignments will also count and will be given every 1-2 weeks. Late homework may not be accepted or be subject to point reductions.

Lectures: Class notes are the primary study source. Occasionally, sections in the book will be skipped and supplemented by topics from outside sources.

The information given here is subject to change. Any major changes will be announced in lecture.