Math 465A, Numerical Analysis

Lecture:	MWF 9:30, BLD 392
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TA:	Sam Adli
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Text:	*Numerical Analysis* (required) by L. W. Johnson & R. D. Riess

Numerical Analysis is available at Professional Copy, 4200 University Ave NE.

Math 464-5-6 is an introduction to numerical analysis. In Math 465 we will introduce some new topics and elaborate on some old topics.

1. Numerical calculation of eigenvalues
2. Numerical solutions of polynomial equations
3. Numerical solution of systems of non-linear equations
4. Orthogonal polynomials and least squares
5. Gaussian quadrature
6. Fast Fourier transform

The homework will count 20% of the course grade. There will be one 50 minute in class test which will count 20% of the course grade. There will be four computer projects which all together will count for 20% of the grade. The midterm test will be closed book but you will be allowed to bring notes on one side of a notebook size sheet of paper. There will be a two hour closed book final exam which will count 40% of the course grade. For the final you will be allowed to bring notes on both sides of a notebook size sheet of paper. You may use scientific calculators in which no formulas or text has been stored on the midterm and final.

The following books have been placed on reserve in the Mathematics Research Library:

1. *Numerical Analysis* by Johnson and Riess (QA297 .J63)

2. *Elementary Numerical Analysis : An Algorithmic Approach* by Conte and de Boor (QA297 .C65 1980)

3. *Numerical Analysis* by Kincaid and Cheney (QA297 .K563)

4. *Handbook for Matrix Computations* by Coleman and Van Loan (QA188 .C64)

5. *Applied and Computational Complex Analysis, Vol. 3* by Peter Henrici (QA331 .H453 1974 v.3)

I remind you that I want you to participate in class. Please don't be shy about asking questions. Look again at the paragraph I wrote for Math 464 if you need encouragement. Don't be discouraged by difficult problems.

Here are the homework assignments. I may have to revise the due dates, depending on whether or not I can keep to my intended schedule. I will be away on Department business the week of January 18-22. The quiz section will meet on January 21. We can discuss how to make up the missed lectures.

DATE	ASSIGNMENT (from Johnson & Riess)
Jan. 7	§3.2: 3, 4, 7, 8, 9
Jan. 14	§3.2: 10 13; §3.2.4: 2, 4, 12, 15, 16
Jan. 21	§3.3: 2, 3, 5, 8, 10
Jan. 28	§3.3.1: 3b, 4, 5, 7a, 10, 11a 13; §3.3.2: 2a(i), 3a, 4, 6, 7, 9(i), 13
Feb. 4	§3.4: 3, 11, 13, 16; §4.3.5: 7
Feb. 11	§4.4.2: 1; §4.4.4: 4, 5
Feb. 12	**MIDTERM**
Feb. 18	§5.3.1: 10 (don't do the computer program part)
Feb. 25	§5.3.2: 1, 4, 6; §5.3.3: 2a, 3, 4, 7, 8
Mar. 4	§6.5.3: 1, 2, 5, 6; §6.6.2: 7, 9
Mar. 17	8:30 am **FINAL EXAM**

These assignments are due at the beginning of class on the due date. There may be a revision of these dates.

The computer projects will be due as follows:

Jan. 25	Inverse Power Method
Feb. 17	Bairstow's Method
Mar. 1	Orthogonal Polynomials
Mar. 12	Fast Fourier Transform

The Midterm will be on Friday, February 12 and the final is at 8:30 a.m. on Wednesday, March 17.