

Engineering Mathematics III.
Math 353 Section 12, Fall 2008, University of Delaware.

Basic information:

Instructor: Dorjsuren (Dorj) Badamdorj.
Office: 432 Ewing Hall.
Email and Phone: badamdor@math.udel.edu/302-831-0588.
Class Website: <http://www.math.udel.edu/~badamdor/Math353F08.html>
Office Hours: Monday and Wednesday 12 pm - 2 pm, or by arrangement.
Text Book: *Numerical Analysis*, by Timothy Sauer, 2006.
Lectures: MWF 2:30 pm - 3:20 pm, 207 Ewing Hall.

Course Description:

The main topics of this course involve a fundamental introduction to numerical analysis for students in mathematics, the physical sciences, and engineering. Students will learn to identify effective numerical methods to solve problem at hand, and apply those methods. It requires both a theoretical knowledge of the problem and numerical methods for its solution, including their derivation, error analysis, and an idea of their performance and computational simulations. MatLab will be used for programming. In particular we will cover following materials:

- Numerical methods for the root-finding problems.
- Numerical methods for linear and non-linear system of equations.
- Interpolation and methods of curve fitting.
- Numerical integration and differentiation.
- Numerical methods for differential equations (ordinary and partial).

Exams:

There will be three exams (2 midterms and the final). The exams are scheduled as follows:

Midterm Exam 1: Friday October 17, 2008 in 207 Ewing Hall.

Midterm Exam 2: Friday November 21, 2008 in 207 Ewing Hall.

Final Exam: Time and location will be determined by the university.

The midterm exams will be 50 minutes long and it will take place during regular lecture session. *No make up exams will be given without prior notification and a valid documented reason.*

Homework:

Homework assignments will be posted on the class web page and the due dates are listed on the tentative schedule. It is your responsibility to check for assignments regularly on the class web page. Homework assignments will be collected on Wednesday in lecture session and the graded homework will be returned on Monday of the following week.

Projects:

There will be given 2 projects from text book's reality check sections and they are due October 24, 2008 and December 3, 2008 respectively. More details will be posted in the class web site. It requires extensive MatLab programming outside of the class.

Rules for Homework and Projects:

Absolutely, no late homework and projects will be collected. If you must miss a due date because valid reason, you can return it before its due date. All assignments must be stapled, written only one side of the paper and should have included following information on the front cover:

Name/M353 Section 12
Assignment Name and Number/Date.

Show all the necessary steps of solution or points will be deducted. MatLab codes must be printed out as script file and attached to your assignments. All homework and projects are to be done independently, unless specified otherwise.

Attendance:

Attending lectures is a crucial factor to succeed in this course. Missing classes will lead you to fall behind and it is very difficult to catch up. Attendance will be collected randomly in lectures and it will be counted toward your final grade as bonus.

Office Hours:

I maintain regular office hours and encourage you use them. This is a time that I have set-aside only for you. It is very useful that you come prepared with questions. If you need to see me at time other than office hours, feel free to drop in or make an appointment.

Class Website:

It is very helpful to check the class web page at least once a week. All handout materials, homework, practice exams, and announcements will be posted there.

Student Conduct:

All students must be honest and forthright in their academic studies. Though, I hope there never will be a need to address academic dishonesty, I will strongly enforce all provisions noted in the Academic Regulations for undergraduates. See <http://www.udel.edu/stuguide/08-09/code.html#honesty> for further information.

Grading:

All exams, projects and homework assignments will be graded by numerical scores and averaged to your final grade.

Midterm Exams	32% (Each 16%)
Homework	24%
Projects	20% (Each 10%)
Final Exam	24%

Final letter grades will be assigned on the following percentages of your total point score:

[92,100] A, [90,92) A-,
[87,90) B+, [83,87) B, [80,83) B- ,
[76,80) C+, [73,76) C, [69,73) C- ,
[66,69) D+, [63,66) D, [60, 63) D-, [0,60) F.

Tentative schedule

Week of	Topics	Sections (Read)	Activity
Sep 1	Matlab Intro and Mathematical Fundamentals	App A and B.	
Sep 8	Binary Numbers, Errors and Numerical Differentiation	0.2-0.4 and 5.1.	
Sep 15	Numerical Differentiation. Bisection Method	5.1 and 1.1.	Due HW 1.
Sep 22	Newton's Method, FPI and Secant Method	1.2-1.5.	Due HW 2.
Sep 29	Gaussian Elimination Method and Factorization	2.1-2.4.	Due HW 3.
Oct 6	Iterative Methods and Nonlinear systems of equations	2.5-2.7.	Due HW 4.
Oct 13	Interpolation Review	3.1-3.2.	Midterm 1.
Oct 20	Cubic Splines and Least Squares	3.4 and 4.1-4.3.	Due Project 1.
Oct 27	Nonlinear Least Squares. Numerical Integration	4.4 and 5.2-5.4.	Due HW 5.
Nov 3	Gaussian Quadrature and Euler Method (ODE)	5.5 and 6.1.	Due HW 6.
Nov 10	Taylor's method and Runge-Kutta Methods (ODE)	6.2, 6.4 and 6.6.	Due HW 7.
Nov 17	Systems of ODE and Review	6.3.	Midterm 2.
Nov 24	FDM and FEM for BVP	7.1-7.3	Due HW 8.
Dec 1	Parabolic and Hyperbolic PDE	8.1-8.2.	Due Project 2.
Dec 8	Elliptic equation and Review	8.3-8.4	Due HW 9.

Important Dates:

- September 16. Last day to drop without record or fee.
- October 28. Last day to drop without academic penalty.
- November 28. Holiday-no class.