SYLLABUS
Applied Mathematics I - Math 531, Section A
Fall 2010

Professor: Dr. Mark Demers   Phone: (203) 254-4000 Ext. 2252
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Lectures: Bannow 333
Wednesdays 6:30 – 9:00 p.m.

Office Hours: Mondays, 12:00 – 1:00 p.m.
Wednesdays, 11:00 a.m. – 12 p.m. & 5:00 - 6:00 p.m.

Required Text: **Advanced Engineering Mathematics**, 2nd edition, by M. Greenberg. Published by
Prentice Hall. ISBN 0-13-321431-1

Class Website: http://cs.fairfield.edu/~demers/applied
This is a valuable resource which contains the assigned problem sets, brief outlines of
class lectures, and important information and announcements regarding the class.
Bookmark this page.

Prerequisites

Knowledge of elementary and multivariable calculus including the theory and techniques of one variable
continuous functions, basic differentiation theory and techniques and basic integration theory and techniques.

Outline of Topics by Week

Meeting	Sections	Material Covered
9/1	2.1 – 2.3	Introduction to differential equations and modeling; First order linear equation, integrating factors and variation of parameters
9/8	2.4, 2.5	Separable and exact equations, applications
9/15	3.1 – 3.3	Higher order linear equations, linear independence, super-position principle; homogeneous equation, general solutions, constant coefficient case
9/22	3.4 – 3.7	Constant coefficient case, nonhomogeneous equation, undetermined coefficients and variation of parameters
9/29	3.5 – 3.8	Nonconstant coefficient cases; applications
10/6	4.1 – 4.3	Power series solutions, method of Frobenius
10/13	4.4 – 4.6	Special functions: Legendre polynomials, Bessel and Gamma functions
10/20	5.1 – 5.3	Laplace transform, introduction and properties
10/27	5.4 – 5.6	Application to differential equations, discontinuous forcing, delta function
11/3	6.1 – 6.3	Numerical methods: Euler and Runge-Kutta methods
11/10	6.4 – 6.5	Applications; difference equations
11/17	3.9, 8, 10	Systems of linear equations; review of linear algebra
11/24		Thanksgiving
12/1	11.3 – 11.5	Eigenvalue solutions to systems of ordinary differential equations
12/8	7.1 – 7.3	Nonlinear systems; stability of singular points
12/15	7.4 – 7.6	Applications and special equations

This outline is only a broad indication of topics to be covered and may fluctuate depending on our pace during
the term. The numbered sections refer to the required text for the class. There may be additional handouts
during the course of the term which contain required material. It is your responsibility to remain informed about
what is going on in class and to obtain notes from classes you miss during the semester.

Attendance

In my experience, attendance is an important part of doing well in a course. Although no one is required to participate during class, you are encouraged to do so and I hope you will feel comfortable participating throughout the course of the term.

Assignments

Problem sets will be assigned approximately every other week and due dates will be announced when the assignment is given (usually 2-3 weeks). Because they constitute the only graded assignments in the course, the problem sets will be substantial, comprising both examples and proofs to work out on your own.

You should expect to read the text and use it as a reference to complete the problem sets. I also expect you to read the upcoming sections of the text before each class so that you have some idea what material we will cover each week. This will enable you to keep pace with a fast-moving class as well as be better prepared to ask questions during class. Reviewing your notes and the text during the week will also help to keep the ideas fresh in your mind for the next class.

You are invited to attend office hours to discuss the material presented in class or in the text. You are also encouraged to form study groups and work with other students in the class if you find that helpful. But all work you hand in must be written by you and be your own intellectual property. Please refer to the Fairfield Honor Code or ask me if you need further clarification on this issue.

Grading

Your final grade will be determined by averaging the scores of your problem sets.

Students with Disabilities

If you require special accommodations during lectures, please contact Aimee Tiu-Wu at Academic and Disability Support Services, (203) 254-4000 Ext. 2615, or email atiu-wu@fairfield.edu. You should also notify me within two weeks of the start of the semester of any arrangements you make regarding accommodations.