MATH 285
LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS
FALL 2013

Professor: Frank V. Tran
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Office hours: MW: 3:10pm – 4:10pm; F: 11:15 – 12:15pm
TTh: 11:15am – 12:15am and 2:00pm – 3:00pm

Materials Required
Text: Differential Equations and Linear Algebra, 3rd Edition by Stephen W. Goode
Calculator: A TI graphing calculator is highly recommended.

Topics to be covered:

- *First order ordinary differential equations: Separable, Homogeneous of Degree zero. 1st Order Linear, Bernoulli and Exact. Application: orthogonal trajectories, exponential growth and decay, Newton's Law of Cooling and mixing problems.*
- *Second Order Linear (ODE's): Homogeneous with Constant Coefficients, Undetermined Coefficients, Variation of Parameters and Applications.*
- *Matrices and Linear Systems: Matrix Algebra, Special matrices, elementary Operations, Gaussian Elimination, Gauss-Jordon Elimination. Homogeneous Systems and Inverse matrices.*
- *Determinants: Minors & Cofactors techniques.*
- *Vectors spaces: Vectors in R^n, Vector Space, subspace, Linear Combination & Span, Linear Independence, Wronskian, Basis & dimension, Inner Product Spaces.*
- *Linear Transformations: Kernel, Range, Eigenvalues and Eigenvectors, diagonalization, Orthogonal Diagonalization of Symmetric Matrices.*
- *Nth Order Linear Ordinary Differential Equations: Linear Differential Operators, Polynomial Differential Operators, Linear ODE's with Constant Coefficients, the Method of Undetermined Coefficients with Annihilators.*
- *Systems of Differential Equations: Matrix Formulation & solving using Eigenvalues and Eigenvectors. Phase Plane for Linear Autonomous Systems (Maple), Non-Linear Systems: Stability, Equilibrium.*
- *The Laplace Transform: Inverse Transform, Transform of Derivatives and solving Initial Value Equations & systems, the First Shifting theorem.*
- *Series Solutions to Linear ODE's.*

Quizzes:

There will be about 8 quizzes worth 50 points each; four of which are announced and the rest are surprised quizzes. All quizzes are consisting of problems similar to the homework and examples in lectures. There will be no makeup quizzes. At the end of the semester, the highest 7 quiz grades will be used.

Exams

There will be four exams. You will be allowed at most one makeup exam, but only for extreme circumstances with reasonable excuses and documentations must be provided. If you will be unable to take an exam at the scheduled time, ***you must contact me at least two days before the day of the exam to request a makeup exam****. At the end of the semester, if you have missed no more than* ***three*** *classes, 85% of your final exam may be used to replace an exam score if this would be advantageous to your course grade. The exams will test your understanding of the concepts covered in the course. Most of the questions on these exams will require showing a significant amount of work to justify your answer. A correct answer with no work shown will be given a zero. The exams will also require you to explain and interpret your results.* ***Graphing calculator is NOT allowed on any exam.***

Homework

The completion of daily homework is critical to your success in this course. There will be about 11 homework assignments, each counting 10 points that will be collected on every Monday. ***Late homework will not be accepted, even if you are absent****. If you do not turn in assignment on time, you will receive a zero. On each assignment, a small selection of problems will be graded for a few points; the remaining points will be given for the completeness of the assignment. In order to receive credit for "completeness," an honest attempt must be made on each problem. At the end of the semester, the highest 10 scores will be used.*

Most of the homework problems will be related to topics discussed in class; some will ask you to try something we didn't talk about. You should be able to reconcile most difficulties with the homework before class. Please make good use of the tutoring services on campus, and each other. While you may discuss these homework problems (as well as all others) with other students in the class or with me, the solutions turned in should for the most part be your own work. You should not write up solutions as a group.

It is very important both for your understanding of the material and for preparing for exams that you work all the assigned problems as soon as the material is covered in class.

Class Attendance

Attendance at each class meeting is expected and is important for your success in the course. A roll sheet will be passed in the second half of the class (after break time) and it's up to you to sign in. A student may be dropped for excessive (more than four) absences. Pagers and phones should be set so that they do not beep or ring during class.

Grading

Your semester course grade will be determined by your percentage of the total points possible. You should keep an accurate record of your grades. I will provide information on your grade standing after each exam.

	Percentage
Exams	*50%*
Final Exam	*25%*
Quizzes	*12%*
Homework	*10%*
Maple Projects	*3%*

The scale used to convert from total points earned to a letter grade will no more stiff than:

Percentage	*Grade*
90.0 - 100.0	*A*
80.0 - 89.9	*B*
70.0 - 79.9	*C*
60.0 - 69.9	*D*
Below 60.0	*F*

Academic Honesty

I place a high premium on honesty. Therefore, I consider cheating a serious offense, not only to me, and to other students, but ultimately to the cheater. If a student cheats on an exam, either by copying another student's work or by using a cheating device (notes on paper, clothing, desk, etc…) and I catch him or her, I will address it by either giving them an F for the exam, an F for the entire course, or asking the school to dismiss the student.