

Math 285
Differential Equations and Linear Algebra
Fall, 2009

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Office Hours: MW 3:15 - 4:15 p.m.
MW 9:30 - 10:00 p.m.
Text: *Differential Equations and Linear Algebra* 3rd edition
By Stephen Goode and Scott Annin
Calculator: Highly Recommend TI-84 plus, TI-89, or TI-NSpire CAS

Attendance: Regular attendance is mandatory. If you are absent during the add period (the first two weeks of class), you will be dropped and someone on the waiting list will be added. If you absent more than three times, you could be dropped. It is your responsibility as a student to drop yourself if you should quit attending class. You are responsible for the material covered in class during your absence.

Homework: Homework from the text will be assigned on a daily basis. Homework will be collected and graded periodically. The lowest homework grade will be dropped. No late homework accepted! No excuses!

Quizzes: Quizzes will be given as scheduled on the timetable. The lowest quiz grade will be dropped. No make-up quizzes will be given.

Exams: Exams will be given as scheduled on the timetable. No make-up exams will be given. If the final exam percentage is higher than the lowest exam percentage, it will replace the lowest exam percentage.

Final Exam: The final exam is cumulative and will be given as published in the schedule of classes. Failure to take the final will result in a course grade of "F". If the final exam percentage is higher, it will replace the lowest exam percentage.

Computer Labs: We will use MAPLE for computer labs this semester. There will be at least two computer labs during the semester.

Grading:

3 exams @ 20% each	60%
Quizzes	10%
Homework & Labs	5%
Final Exam	25%

90% and above	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
Below 60%	F

Cheating Policy

Acts of cheating and plagiarism are considered serious violations of the Mt. San Antonio College Student Discipline Policy, AR & P Section 609. All incidents of cheating and plagiarism will be reported to the Student Life Center. Cheating or plagiarism is the act of misrepresenting the work of someone else as your own or assisting another student by providing them with answers to exams or written work that is not their own. This includes copying from another, use of stolen exams, instructor's notes or test key, and failure to use quotation marks and citing the source when using the written work of another, including internet sources.

If a student is caught cheating on an exam or a quiz, that student will receive a **“F” for that exam or quiz that can not be dropped or replaced** and could result in disciplinary action such as suspension or expulsion. Students are encouraged to review both the Academic Honesty Policy and the Student Discipline Policy which are printed in the College catalog for further clarification.

Measurable Objectives for Math 285

Students will:

1. Identify and solve the following ordinary differential equations (ODEs): separable, 1st order linear, homogeneous of degree zero, Bernoulli, exact.
2. Set up and solve differential equations for the following applications: simple and logistic population growth model, simple electric circuits, mixing, orthogonal trajectories.
3. Plot slope fields and numerically solve 1st order differential equations using Euler's and Runge Kutta methods.
4. Demonstrate the basic operations of matrix algebra, row operations for linear systems, and the methods of Gaussian Elimination and matrix inversion for solving linear systems.
5. Evaluate determinants using cofactors and row operations. Demonstrate the properties of determinants and matrix inversion using cofactors.
6. Solve problems pertaining to the definitions of vector space, subspace, span, linear dependence and independence, basis, and dimension, row and column space and inner product space.
7. Demonstrate the use of the Gram-Schmidt process for orthogonalization.
8. Solve problems pertaining to the definitions of linear transformation, kernel and range.
9. Compute eigenvalues and eigenvectors.
10. Diagonalize a square matrix, with the special case of orthogonal diagonalization of symmetric matrices.
11. Demonstrate matrix representation of a linear transformation, change of bases.
12. Solve linear differential equations of order n with constant coefficients (homogeneous or non-homogeneous) using the methods of undetermined coefficients and variation of parameters with applications to RLC circuits or mass spring systems.
13. Express a linear system of differential equations in vector form, then solve the system using eigenvalues and eigenvectors, whether the coefficient matrix is defective or not.
14. Analyze non-linear systems numerically, including phase-plane analysis, using a computer algebra system.
15. Apply the Laplace Transform and its inverse, using the basic rules of the Laplace Transform, along with the 1st Shifting Theorem.
16. Solve linear differential equations with constant coefficients using the Laplace Transform.
17. Solve ODEs using power series and method of Frobenius.

The Student Learning Outcomes (SLOs) for this course can be found at my website: www.joansholars.com.

SLOs are used to assess the course--how well or if students are learning a particular topic.

Measurable objectives are instructional expectations for a given course that establish curricular elements and standards.