

Instructor

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Office Hours

M 1215-1315
T 1600-1650
W 1115-1230
Th 1530-1650

Prerequisites

Math 280 or equivalent with grade of C or better.

In addition to this, you will need the desire to learn, the willingness to work hard, and the intestinal fortitude to not give up until you achieve your goal.

Attendance

Be in class, on time, each and every day. Attendance comprises a small part of your course grade and missing class will adversely affect your course grade. From page 21 of the 2011-2012 SCC Catalog: "A student may be dropped for excessive absences when the total hours of absence exceed 10% of the total scheduled hours of class." For Spring 2012, this means I will drop you for excessive absence if you miss more than 3 class meetings.

Withdrawals

If you decide to drop this class, it is *your responsibility* to follow the correct procedures. The last day to drop this class with no record of participation is February 5, 2012, and the last day to drop this class with a W grade is April 22, 2012. Again, it is *your responsibility* to be aware of and to follow the correct procedures.

Academic Honesty

Students attending Santiago Canyon College are expected to be honest and forthright in their academic endeavors. To falsify the results of research, to steal the words or ideas of another or to cheat on an examination, corrupts the essential process by which knowledge is advanced. Academic dishonesty is seen as an intentional act of fraud, in which a student seeks to claim credit for the work or efforts of another without authorization, or uses unauthorized material or fabricated information in any academic exercise. We, as an institution, also consider academic dishonesty to include forgery of academic documents, intentionally impeding or damaging the academic work of others, assisting other students in acts of dishonesty or coercing students into acts of dishonesty.

In matters relating to academic honesty violations, the primary responsibility for disciplinary proceedings rests with the instructor and the academic division where the violation allegedly occurred.

Student Conduct

Based upon the RSCCD Standards of Student Conduct (also known as the Code of Conduct) all students will be in violation of the code if you disrupt the teaching of this class. Penalties that may be invoked include warnings, probation and suspension from all classes and activities within the district.

You will behave in a manner that is conducive to the progress of this class. If you are disruptive in any way, I will inform you in a clear, unambiguous manner. As the professor of record for this class, I will determine the standard of behavior.

Your cell phone is to be turned off at the beginning of each class meeting. You are free to turn it on at any time after class has concluded.

Accommodations for Disabilities

Students with verifiable disabilities who want to request academic accommodations are responsible for notifying their instructor and Disabled Students Programs and Service (DSPS) as early as possible in the semester. To arrange for accommodations, contact DSPS at (714) 628-4860 or by TDD (714) 639-9742 or stop by the DSPS Center in E-105.

Math Study Hall (MaSH) Registration

MaSH (Math Study Hall) is a service provided by SCC that gives you a chance to supplement learning done in the classroom. There will always be a math faculty member, instructional aides and student workers on duty to assist you when needed. There are also computers where you can access mathematical software or do work for your on-line math class. When you enter MaSH, you will slide your student ID card or type in your ID number at the sign-in computer (no SSN). When you leave, you will sign out the same way. Signing out is very important.

For Spring 2012, Mash is open MTWTh 8am-7:30pm and Sat 9am-3pm.

Calculator Use

You will want a graphing calculator for this course. Any type of calculator is fine; I expect you to be able to demonstrate your understanding of the concepts and principles independent of any particular piece of technology. We will discuss appropriate use of the calculator in class.

Exams

Exams are *tentatively* scheduled for February 23, April 5, and May 10, 2012. I reserve the right to change the date to reflect the progress we make in the class, but I promise to always give you at least a one week notice before an exam.

Quizzes

A short quiz will be given on the average of once each week. Some quizzes will be at the beginning of the class time, some in the middle, and some at the end of the class time.

There are no make-up quizzes given for any reason. To compensate for unavoidable absences, I will drop your lowest quiz score at the end of the semester.

Homework

Doing work outside of class time provides the essential practice needed for success in mathematics. Plan to spend at least **three** hours outside of class for each hour in class. These three hours may include reviewing your class notes, reading the textbook, working on the assigned problems, reviewing older homework assignments.

Homework assigned for each day is to be completed by the following class meeting. Homework will be collected on a random basis and scored. You will receive full credit if you attempt all the assigned problems.

Finally, late homework will not be accepted for any reason.

Final Exam

The final exam will be administered during the last regularly scheduled class meeting: Thursday, May 17, 2012. No early or late final exams will be administered.

Grades

Your grade in this class is computed using a weighted average with the following category weights and letter grade assignments with p being your class percentage and l being the letter grade:

Exams 50%	If $p \geq 90$, then	$l = A$
Quizzes 10%	If $80 \leq p < 90$, then	$l = B$
Homework 10%	If $70 \leq p < 80$, then	$l = C$
Attendance 5%	If $60 \leq p < 70$, then	$l = D$
Final Exam 25%	If $\leq p < 60$, then	$l = F$

For example, to find your exam category score, compute the average (arithmetic mean) of the percentage of each of your exam scores. To find your quizzes category score, compute the average (arithmetic mean) of the percentage of each of your quiz scores. Sum the products of all the category scores and the weight, and the result is your class percentage.

SomeThoughts

I believe that each and everyone of you can be successful with mathematics. I believe that being able to understand and communicate mathematics is of critical importance for you, your children, and all the future generations of your family. If you work hard and maintain a positive, productive attitude, you will gain an understanding of mathematics that will insure your success for many years to come.

Santiago Canyon College, Spring 2012, Mr. Scott

Math 287, Introduction to Linear Algebra & Differential Equations

Text: Goode, Stephen & Annin, Scott, *Differential Equations & Linear Algebra*, 3e

All of the following refer to the **Problems** section of the exercise sets.

Ch. 1 First-Order Differential Equations

Section	Assignment
1.1 How Differential Equations Arise	1, 3, 7, 11, 13, 15, 24
1.2 Basic Ideas and Terminology	1-6, 7, 9, 13, 17, 21, 27, 29, 33, 35, 37, 39, 43*, 49*
1.3 The Geometry of First-Order Differential Equations	1, 3, 7, 9, 12-15, 19, 23, 27*, 31*, 32*
1.4 Separable Differential Equations	1, 3, 5, 7, 8, 13, 14, 17, 25
1.5 Some Simple Population Models	1, 4, 5, 9, 10
1.6 First-Order Linear Differential Equations	1, 3, 5, 6, 11, 13, 17, 19, 22, 28, 29, 31
1.7 Modeling Problems Using FOLDEs	1, 3, 5, 9, 11, 12, 13
1.8 Change of Variables	1, 3, 5, 7, 11, 15, 19, 25, 28a, 29, 37, 39, 44, 51
1.9 Exact Differential Equations	1-3, 5, 9, 13, 17, 21, 25
1.10 Numerical Solution to First-Order Differential Equations	1, 3, 11, 13
1.11 Some Higher-Order Differential Equations	1, 3, 4, 11, 15
1.12 Chapter Review	

Ch. 2 Matrices and Systems of Linear Equations

Section	Assignment
2.1 Matrices: Def'ns and Notation	1, 5, 6, 9, 12, 13, 14, 16-20, 21, 23
2.2 Matrix Algebra	2, 3, 4, 7, 10, 11, 13, 14, 19, 20, 27, 31, 32, 33, 34, 37, 40, 41, 42, 43
2.3 Terminology for Systems of Linear Equations	3, 6, 7, 9, 10, 11, 13, 14, 15
2.4 Elementary Row Operations and Row-Echelon Matrices	1, 4, 7, 8, 10, 11, 15, 23
2.5 Gaussian Elimination	3, 4, 7, 9, 12, 13, 17, 18, 21, 23, 25, 37, 39, 41, 45, 50
2.6 The Inverse of a Square Matrix	4, 5, 11, 20, 21, 25, 29, 30, 37
2.7 Elementary Matrices and the LU Factorization	2, 3, 7, 11
2.8 The Invertible Matrix Theorem	1, 2, 3
2.9 Chapter Review	

Ch. 3 Determinants

Section	Assignment
3.1 The Def'n of the Determinant	3, 4, 5, 7, 9, 11, 15, 16, 21, 22, 23
3.2 Properties of the Determinant	5, 10, 15, 18, 20, 21, 23, 31, 33, 42, 46, 49
3.3 Cofactor Expansions	1, 4, 5, 10, 15, 23, 29, 33, 37
3.4 Summary of Determinants	3, 7, 8, 9, 18, 19
3.5 Chapter Review	

Ch. 4 Vector Spaces

Section	Assignment
4.1 Vectors in \mathbb{R}^2	1, 3, 4
4.2 Def'n of a Vector Space	1, 2, 3, 4, 5, 7, 9, 10, 11, 17, 18
4.3 Subspaces	1, 3, 4, 7, 8, 9, 11, 13, 14, 15, 18, 21, 22
4.4 Spanning Sets	1, 3, 7, 9, 11, 15, 19, 20, 23, 24, 27, 28
4.5 Linear Dependence and Linear Independence	3, 4, 5, 7, 11, 13, 15, 16, 18, 19, 23, 26, 27, 29, 31, 39, 45
4.6 Bases and Dimension	3, 5, 11, 13, 15, 21, 22, 27, 32, 33, 34
4.7 Change of Basis	1, 3, 7, 9, 11, 17, 19, 21, 23

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4.8 Row Space and Column Space	1, 3, 6, 7, 8
4.9 The Rank-Nullity Theorem	1, 3, 4, 5, 6, 9, 11, 12
4.10 The Invertible Matrix Theorem II	Do the True-False Review, 1-10
4.11 Inner Product Spaces	1, 3, 4, 6, 13-17
4.12 Orthogonal Sets of Vectors and the Gram-Schmidt Process	3, 5, 7, 9, 11, 13, 15, 21, 23, 29
4.13 Chapter Review	

Ch. 5 Linear Transformations

Section	Assignment
5.1 Definition of a Linear Transformation	1, 3, 5, 6, 13, 14, 17, 19, 23, 28, 29
5.2 Transformations of \mathbb{R}^2	1, 2, 7, 9
5.3 The Kernel and Range of a Linear Transformation	1, 2, 5, 12, 13, 15
5.4 Additional Properties of Linear Transformations	1, 3, 4, 5, 9, 15, 16, 25
5.5 The Matrix of a Linear Transformation	1, 5, 7, 11, 15
5.6 The Eigenvalue/Eigenvector Problem	3, 5, 7, 11, 15, 20, 29, 32, 36, 37
5.7 General results for Eigenvalues and Eigenvectors	1, 5, 13, 15, 17, 19, 26, 27
5.8 Diagonalization	1, 5, 9, 15, 17, 21, 25
5.9 An Introduction to the Matrix Exponential Function	1, 2, 3, 7, 11
5.10 Orthogonal Diagonalization and Quadratic Forms	1, 5, 11, 13, 15, 19
5.11 Jordan Canonical Forms	1, 3, 5, 11, 12, 17, 19
5.12 Chapter Review	

Ch. 6 Linear Differential Equations of Order n

Section	Assignment
6.1 General Theory for Linear Differential Equations	2, 3, 5, 7, 9, 11, 13, 16, 17, 21, 23, 25, 27
6.2 Constant-Coefficient Homogeneous Linear Differential Equations	5, 7, 11, 15, 17, 20, 29, 30, 32, 33, 40
6.3 The Method of Undetermined Coefficients: Annihilators	1, 3, 7, 13, 17, 21, 23
6.4 Complex-Valued Trial Solutions	1, 2, 5, 6
6.5 Oscillations of a Mechanical System	1, 5, 9, 13, 17, 19, 23, 31
6.6 RLC Circuits	1, 2, 3, 5
6.7 The Variation-of-Parameters Method	1, 3, 5, 11, 23, 25
6.8 A Differential Equation with Nonconstant Coefficients	3, 7, 9, 11, 15, 17
6.9 Reduction of Order	1, 5, 7, 11, 13
6.10 Chapter Review	

Ch. 7 Systems of Differential Equations

Section	Assignment
7.1 First-Order Linear Systems	1, 2, 5, 9, 11, 15, 17
7.2 Vector Formulation	1, 3, 7, 9, 13
7.3 General Results for First-Order Linear Differential Systems	1, 5
7.4 Vector Differential Equations: Nondefective Coefficient Matrix	1, 5, 7, 9, 13, 17, 19, 22, 23, 24
7.5 Vector Differential Equations: Defective Coefficient Matrix	1, 3, 5, 9, 15
7.6 Variation-of-Parameters for Linear Systems	1, 3, 7, 10

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7.7 Some Applications of Linear Systems of Differential Equations	3, 9, 11
7.8 Matrix Exponential Function and Systems of Differential Equations	1, 3, 5, 9
7.9 The Phase Plane for Linear Autonomous Systems	1, 3, 7, 13, 21, 23
7.10 Nonlinear Systems	1, 5, 7, 9
7.11 Chapter Review	

Ch. 8 The Laplace Transform and Some Elementary Applications

Section	Assignment
8.1 Definition of the Laplace Transform	1, 3, 5, 9, 11, 13, 15, 19, 23, 25, 29, 31, 33, 35, 36
8.2 The Existence of the Laplace Transform and the Inverse Transform	1, 3, 5, 7, 9, 15, 19
8.3 Periodic Functions and the Laplace Transform	1, 3, 7
8.4 The Transform of Derivatives and Solution of Initial-Value Problems	1, 5, 9, 11, 17, 21, 25, 29
8.5 The First Shifting Theorem	3, 5, 7, 13, 14, 19, 23, 29, 30, 37, 43, 51
8.6 The Unit Step Function	1, 3, 7, 13
8.7 The Second Shifting Theorem	1, 3, 7, 9, 13, 17, 23, 27, 31, 35
8.8 Impulsive Driving Terms: The Dirac Delta Function	1, 3, 7, 11, 13
8.9 The Convolution Integral	1, 3, 9, 11, 15, 21, 23, 25, 27
8.10 Chapter Review	

Ch. 9 Series Solutions to Differential Equations

Section	Assignment
9.1 A Review of Power Series	1, 3, 5, 7, 9, 11
9.2 Series Solutions about an Ordinary Point	1, 5, 9, 11, 13, 15
9.3 The Legendre Equation	1, 2, 3, 7
9.4 Series Solutions about a Regular Singular Point	1, 3, 5, 9, 13
9.5 Frobenius Theory	1, 5, 11, 13, 19
9.6 Bessel's Equation of Order p	1, 2, 3, 4, 5
9.7 Chapter Review	

Useful Websites:

<http://integrals.wolfram.com/>

<http://www.calculus.org/>

<http://www.math.montana.edu/frankw/ccp/multiworld/topic.htm>

<http://faculty.eicc.edu/bwood/ma220supplemental/ma220supplemental.html>