Instructor:
Dr. Chris Lee   Trexler 270D
375-2347   clee@roanoke.edu

Office Hours:
Tue/Thu: 1:00 - 3:00pm, Wed: 2:30 – 3:30pm
Any time by appointment.

Course Objectives: Linear algebra is a course that mixes basic equation-solving, abstract theory and deep applications. The main objects of study are matrices, vectors and vector spaces, and we will focus on the interplay between computational and theoretical aspects. This material is used in many higher level math courses as well as in many related fields.

Intended Learning Outcomes: At the end of the course, successful students will be able to
- State and apply each of the equivalent parts of the Invertible Matrix Theorem
- Graphically analyze linear transforms
- Identify vector spaces and their dimensions
- In the context of various applications, set up systems of equations

Required Text: *Linear Algebra and its Applications* by Lay, Lay, and McDonald 5th edition

Reading and Participation: The key to learning a topic in mathematics is participation. We will strive to have an active, rather than passive, classroom environment. The last page of the syllabus is a day by day outline of the sections that will be discussed in class. You are fully expected to have read the upcoming section before the class meeting!

Attendance: Attendance is critical to the understanding of the material in the course; it is both required and expected. Any absence that is not discussed with the instructor prior to the missed class is considered unexcused. I will assume that if you accumulate 3 unexcused absences you are not interested in completing the course and will drop you from the class with a grade of DF (dropped-failing) recorded, regardless of your current average in the course. You, your advisor, and the registrar will receive a warning email at your second unexcused absence. When absent, excused or unexcused, you are responsible for all material covered in class. Work missed due to either an unexcused or excused absence can only be made up when arrangements are made in advance of the absence.

Homework: Homework problems will be assigned and collected almost every class period and are due at the start of the next class period. Each HW assignment is graded satisfactory/unsatisfactory. Your HW average is calculated at the end of the term by the percentage of assignments that are satisfactory. The following criterion must be met on an individual assignment for it to be considered satisfactory:
- Each and every problem must be attempted.
- Work must be shown on each problem!
- At least two-thirds of the problems must be worked to completion (errors are allowed, we're learning here)

Quizzes / Tests: You will not be able to procrastinate in this course. There will be 6 tests and at least 6 quizzes. Each week there will be either a quiz or test. We will not spend time reviewing for these, the review is simply to complete the homework assigned and participate in class. **NOTE**: There is a test on the Friday before break, do not miss that day!

Final Exam: The final exam will be cumulative, equally covering all material presented in the course.

Grading: Components of a student's grade will be weighted as follows:

Tests	63%
Homework / Quizzes	15%
Final Exam	22%
	100%

A grade scale will be determined after final averages are computed, but will be no worse than the scale given below.

0	60	63	67	70	73	77	80	83	87	90	93
F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

Late Work: Unless specific permission is given in advance of the due date, no late work will be accepted.

Cell Phones: This is very simple - no cells phones are allowed to be used or even visible in our classroom. This includes before, during, and after class. If a cell phone is seen, the student will be asked to leave the classroom and the day will be counted as an unexcused absence.

Academic Integrity: Students are expected to adhere to the Academic Integrity policies of Roanoke College. All work submitted for a grade is to be your own work! No electronic devices other than calculators can be taken out during any class or testing period.

MCSP Conversations: The Math, Computer Science and Physics department offers a series of discussions that appeal to a broad range of interests related to these fields of study.   These co-curricular sessions will engage the community to think about ongoing research, novel applications and other issues that face our discipline.

Sessions are currently being scheduled, and all will be announced in advance.

Members of this class are invited be involved with all of these meetings; however participation in **at least two** of these sessions is mandatory.   After attending, students will submit within one week of the presentation a one-page+ paper reflecting on the discussion.   This should *not* simply be a regurgitation of the content, but rather a personal contemplation of the experience.

The Office of Disability Support Services (DSS), is located in the Goode-Pasfield Center for Learning and Teaching in **Fintel Library**. DSS provides reasonable accommodations to students with documented disabilities. To register for Disability Support Services, students must self-identify to the Office of Disability Support Services, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact JoAnn Stephens-Forrest, MSW, Coordinator of Disability Support Services, at 540-375-2247 or e-mail her at: stephens@roanoke.edu to schedule an appointment. If you have registered with DSS in the past, and would like to receive academic accommodations for this semester, please contact Ms. Stephens-Forrest at your earliest convenience, to schedule an appointment.

Course Schedule

This course expects you to spend at least 12 hours of work each week inside and outside of class.

Date		Section
Wed	Aug 31	1.1 Systems of Linear Equations
Fri		1.2 Row Reduction and Echelon Forms
Mon	Sept 5	1.3 Vector Equations
Wed		1.4 Matrix Equations
Fri		Quiz / Activity
Mon	Sept 12	1.5 Solution Sets of Linear Systems
Wed		1.7 Linear Independence
Fri		**Test 1**
Mon	Sept 19	1.8 Introduction to Linear Transformations
Wed		1.9 The Matrix of a Linear Transformation
Fri		Quiz / Activity
Mon	Sept 26	2.1 Matrix Operations
Wed		2.2 The Inverse of a Matrix
Fri		**Test 2**
Mon	Oct 3	2.4, 2.5 Partitioned Matrices / Matrix Factorizations
Wed		3.1 Introduction to Determinants
Fri		Quiz / Activity
Mon	Oct 10	3.2 Properties of Determinants
Wed		4.1 Vector Spaces and Subspaces
Fri		**Test 3**
Fall Break		
Mon	Oct 24	4.1 Vector Spaces and Subspaces
Wed		4.2 Null Spaces, Column Spaces, Linear Transformations
Fri		Quiz / Activity
Mon	Oct 31	4.3 Linearly Independent Sets; Bases
Wed		4.4 Coordinate Systems
Fri		**Test 4**
Mon	Nov 7	4.5 Dimension of a Vector Space
Wed		4.6 Rank
Fri		Quiz / Activity
Mon	Nov 14	4.7 Change of Basis
Wed		5.1, 5.2 Eigenvectors, Eigenvalues, Characteristic Equation
Fri		**Test 5**
Mon	Nov 21	5.3 Diagonalization
Thanksgiving Break		
Mon	Nov 28	6.1 Inner Product, Length, and Orthogonality
Wed		6.2 Orthogonal Sets
Fri		Quiz / Activity
Mon	Dec 5	6.3 Orthogonal Projections
Wed		**Test 6**
Fri		*Wrap Up / Review*
	Dec 14	**Final Exam** 2:00-5:00pm