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

Office Hours: Have a question? Please stop by my office to chat. Regular office hours are listed below, and I welcome you to contact me to make an appointment outside of these hours:

Tue: 1:00 – 2:00 pm Wed: 2:15 – 3:15 pm, Thu: 1:00 – 2:00 pm.

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 6th edition

Attendance: Come to class and be prepared to actively participate - this is the best way for you to engage in the learning material and it makes our class meeting so much more fun! You should attend every class, but extenuating circumstances can arise that can make this difficult. If you cannot attend a class, please let me know. If circumstances cause you to miss more than 3 classes during the semester, you may be overextended and should consider dropping the class.

Reading and Participation: Participation is key to learning. We will strive to have an active, rather than passive, classroom environment. On Inquire is a day-by-day outline of the chapters that will be discussed in class. I fully hope that you will have read the upcoming chapter before the class meeting. You most certainly will not understand everything while you are reading ahead, but having read the section will allow you to ask questions and follow along better in class.

Late & Missed Work: Unfortunately, illnesses, death in the family, or other traumatic events are part of life. Such events are unwelcome and because I understand how difficult these times are, if you contact me within 24 hours of the event and provide documentation, I will be happy to extend deadlines and/or provide make-up work.

Expected Hours of Work: To be successful in this course it is anticipated that you will put in at least 12 hours of work inside and outside of class each week.

Academic Integrity: Students are expected to follow the integrity policy detailed in the handbook *Academic Integrity at Roanoke College*. Additionally, if you are ever uncertain as to how the College's policy pertains to any assignment or exam in this course, please ask me for clarification. The bottom line is that all work that a student submits for a grade must be ***solely*** the work of that student unless the instructor has given explicit permission for students to work together.

Retrieval Practice: A clear and most important goal of this course is to give you an exposure to and understanding of linear algebra. There is a large difference between the intake of course information, and the retrieval of such information. And, shown by study after study, if you wish to be able to retrieve information you must PRACTICE retrieving information. To aid in this retrieval practice there are a variety of assessment activities throughout the term, the goal being higher frequency with less weight on any particular event. You will encounter daily homework, quizzes, projects, and graded problem sets.

Everything is Cumulative: You will find that virtually every day in class we will be combining information from previous chapters with material we are currently studying, and this pattern will carry over to all your graded work. I am committed to helping you put together a large course basket of knowledge this semester and to giving you frequent opportunities to practice retrieval of this knowledge. To that end, all quizzes, tests, and the final exam are cumulative. On any one of these approximately 50% of the assessment will be on fundamentals of previous material and 50% on new material.

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

Tests: 60% HW/Quizzes: 10% Projects: 10% Final Exam: 20%

A scale will for final grades will not be lower 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

MATH 201 Daily Schedule - Spring 2025

Jan 13	1.1 Systems of Linear Equations	
Jan 15	1.2 Row Reduction and Echelon Forms	
Jan 17	1.3 Vector Equations	Quiz
Jan 20	**no class meeting**	
Jan 22	1.4, 1.5 Matrix Equations & Solution Sets of Linear Systems	
Jan 24	1.7 Linear Independence	Quiz
Jan 27	1.8 Introduction to Linear Transformations	
Jan 29	1.9 The Matrix of a Linear Transformation	
Jan 31	**Review**	
Feb 3	**Test 1**	
Feb 5	2.1 Matrix Operations	
Feb 7	2.2 The Inverse of a Matrix	Quiz
Feb 10	**Project Day**	
Feb 12	2.4, 2.5 Partitioned Matrices / Matrix Factorizations	
Feb 14	2.7 Applications in Computer Graphics	Quiz
Feb 17	2.8 Subspaces	
Feb 19	2.9 Dimension and Rank	
Feb 21	**Review**	
Feb 24	**Test 2**	
Feb 26	3.1 Introduction to Determinants	
Feb 28	3.2 Properties of Determinants	Quiz
Fall Break		
Mar 10	4.1 Vector Spaces and Subspaces	
Mar 12	4.1 Vector Spaces and Subspaces	
Mar 14	4.2 Null & Column Spaces, Transformations	Quiz
Mar 17	4.3 Linearly Independent Sets; Bases	
Mar 19	**Project Day**	
Mar 21	4.4 Coordinate Systems	Quiz
Mar 24	4.5 Dimension of a Vector Space	
Mar 26	4.6 Change of Basis	
Mar 28	**Review**	
Mar 31	**Test 3**	
Apr 2	5.1, 5.2 Eigenvectors, Eigenvalues, Characteristic Equation	
Apr 4	5.3 Diagonalization	Quiz
Apr 7	6.1 Inner Product, Length, and Orthogonality	
Apr 9	6.2 Orthogonal Sets	
Apr 11	6.3 Orthogonal Projections	Quiz
Apr 14	**Review**	
Apr 16	**Test 4**	
Apr 21	**Review**	
Apr 22	**no class meeting - office hours instead**	
Apr 26	**Final Exam 8:30-11:30am**	