

# TOPICS SCHEDULE<sup>1</sup>

MATH 4A: LINEAR ALGEBRA AND APPLICATIONS

PROFESSOR: PAUL J. ATZBERGER

Dates	Topics	Chapter <sup>2</sup>	Web-Work
Week 1 (1/16-1/18)	Systems of Linear Equations, Row Reduction and Echelon Forms, Vector Equations	1.1 – 1.3	HW 1, Assigned 1/16, Due 1/23.
Week 2 (1/23-1/25)	The Matrix Equation $Ax = b$ , Solution Sets of Linear Systems, Applications of Linear Systems	1.4 - 1.7	HW 2, Assigned 1/23, Due 1/30.
Week 3 (1/30-2/1)	Linear Independence, Introduction to Linear Transformations, The Matrix of a Linear Transformation	1.7 - 1.9	HW 3, Assigned 1/30, Due 2/6.
Week 4 (2/6-2/8)	Matrix Operations, The Inverse of a Matrix, Characterizations of Invertible Matrices	2.1 - 2.3	HW 4, Assigned 2/1, Due 2/12.
Midterm Exam (2/13)	Midterm Exam: 8:00am – 9:15am on topics covered to date.	topics from 1.1 - 2.3	
Week 5 (2/15)	Subspaces of $\mathbb{R}^n$ , Dimension and Rank, Introduction to Determinants	2.8, 2.9, 3.1	HW 5, Assigned 2/13, Due 2/20.
Week 6 (2/20-2/22)	Properties of Determinants, Cramer's Rule, Volume, and Linear Transformations, Vector Spaces and Subspaces	3.2, 3.3, 4.1	HW 6, Assigned 2/20, Due 2/27.
Week 7 (2/27-3/1)	Null Spaces, Column Spaces, and Linear Transformations, Linearly Independent Sets; Bases	4.2-4.3	HW 7, Assigned 2/27, Due 3/6.
Week 8 (3/6-3/8)	Eigenvectors and Eigenvalues, The Characteristic Equation, Inner Product, Length, and Orthogonality	5.1, 5.2, 6.1	HW 8, Assigned 3/6, Due 3/13.
Week 9 (3/13-3/15)	Orthogonal Sets, Orthogonal Projections, Least-Squares Problems	6.2, 6.3, 6.5	HW9, Assigned 3/8, Due 3/29.
Final Exam 3/22	Final Exam: 8:00am-11:00am on topics covered to date.	cumulative	

[1] Please note that this is the anticipated schedule of topics but is subject to change and adjustment as needed during the quarter.

[2] All book chapters and sections refer to David Lay et al., *Linear Algebra with Applications* (5<sup>th</sup> Edition).