

Mathematics 2270

Spring, 2020 Course Outline

Week 1: (January 6-10)

Introduction/Syllabus

- 1.1 Systems of Linear Equations
- 1.2 Row reduction and Echelon forms

Week 2: (January 13-17)

- 1.3 Vector equations
- 1.4 Matrix equations
- 1.5 Solution sets of linear systems

Week 3: (January 20-24)

- 1.6 Applications of linear systems
- 1.7 Linear independence
- 1.8 Introduction to linear transformations

Week 4: (January 27-31)

- 1.9 The matrix of a linear transformation
- 2.1 Matrix operations
- 2.2 The inverse of a matrix

Week 5: (February 3-7)

- (snow day)
- 2.2 The inverse of a matrix
- 2.3 Characterizations of invertible matrices
- Midterm 1 (Friday)**

Week 6: (February 10-14)

- 2.4 Partitioned matrices
- 2.5 Matrix factorizations
- 3.1 Introduction to determinants
- 3.2 Properties of determinants

Week 7: (February 17-21)

- 3.3 Cramer's rule, volume and linear transformations
- 4.1 Vector spaces and subspaces
- 4.2 Null spaces, column spaces and linear transformations

Week 8: (February 24-28)

- 4.3 Linearly independent sets and bases
- 4.4 Coordinate systems
- 4.5 The dimension of a vector space

Week 9: (March 2-6)

- 4.6 Rank
- 4.7 Change of basis
- 5.1 Eigenvectors and eigenvalues

Spring Break Week: (March 9-13)

Spring Break

Week 10: (March 16-20)

- (Monday--COVID 19 class cancelled)
- 5.2 The characteristic equation
- 5.3 Diagonalization

Week 11: (March 23-27)

- Take-home Midterm 2 (Monday)**
- 5.4 Eigenvectors and linear transformations
- 5.5 Complex eigenvalues

Week 12: (March 30-April 3)

- 6.1 Inner product, length and orthogonality
- 6.2 Orthogonal sets
- 6.3 Orthogonal projections

Week 13: (April 6-10)

- 6.4 Gram-Schmidt process
- 6.5 Least squares problems
- 7.1 Diagonalization of symmetric matrices

Week 14: (April 13-17)

- 7.2 Quadratic Forms
- 7.3 Constrained optimization
- 7.4 The singular value decomposition

Week 15: (April 20-24)

- Project 2 Poster Presentations (virtual)
- Final Review

Extra Final Review:

Tuesday, April 28, 10:00 to 11:30 am

Final Exam:

Wednesday, April 29, 8:00 to 10:00 am

Last Day to Drop: Friday, January 17

Last Day to Withdraw: Friday, March 6