Math 251 Class Outline

System of Linear Equations and Matrices

Text(Week)	Hours	Topic
1.1 (1)	**read**	Introduction to Systems of Linear Equations
1.2 (1)	1	Gaussian Elimination
1.3 (1)	1	Matrices and Matrix Operations
1.4 (1)	1	Inverses; Rules of Matrix Arithmetic
1 July, 2005		**Canada Day**
1.5 (2)	2	Elementary Matrices and a Method for Finding $\mathbf{A}^{-1}$
1.6 (2)	1	Further Results on Systems of Equations and Invertibility
1.7 (2)	1	Diagonal, Triangular, and Symmetric Matrices
Total hours	**7**	

Determinants

Text(Week)	Hours	Topic
2.1 (2)	1	Determinants by Cofactor Expansion
2.2 (2, 3)	2	Evaluating Determinants by Row Reduction
2.3 (3)	2	Properties of the Determinant Function
Total hours	**5**	

Vectors in 2-Space and 3-Space

Text(Week)	Hours	Topic
3.1 (3)	**read**	Introduction to Vectors (Geometric)
3.2 (3)	1	Norm of a Vector; Vector Arithmetic
3.3 (3, 4)	2	Dot product; Projections
15 July 2005		**Test 1**
3.4 (4)	2	Cross Product
3.5 (4)	2	Lines and Planes in 3-Space
Total hours	**7**	

Euclidean Vector Spaces

Text(Week)	Hours	Topic
4.1 (4)	1	Euclidean **n-**Space
4.2 (5)	2	Linear Transformations from $\mathbf{R}^n$ to $\mathbf{R}^m$
Total hours	**3**	

General Vector Spaces

Text(Week)	Hours	Topic
5.1 (5)	1	Real Vector Spaces
5.2 (5)	1	Subspaces
5.3 (5, 6)	2	Linear Independence
29 July 2005		**Test 2**
1 August 2005		**BC Day**
5.4 (6)	2	Basis and Dimension
5.5 (6)	2	Row Space, Column Space, and Nullspace
5.6 (7)	2	Rank and Nullity
Total hours	**10**	

Outline (Continued)

Inner Product Spaces

Text(Week)	Hours	Topic
6.1 (7)	2	Inner Products
6.2 (7, 8)	2	Angle and Orthogonality in Inner Product Spaces
12 August 2005		**Test 3**
6.3 (8)	2	Orthonormal Bases; Gram-Schmidt Process
6.4 (8)	2	Best Approximation; Least Squares
6.5 (8)	1	Change of Basis
6.6 (9)	1	Orthogonal Matrices
Total hours	**10**	

Eigenvalues, Eigenvectors

Text(Week)	Hours	Topic
7.1 (9)	2	Eigenvalues and Eigenvectors
7.2 (9)	2	Diagonalization
26 August 2005		**Test 4**
Total hours	**4**	

Linear Transformations

Text(Week)	Hours	Topic
8.1 (10)	2	General Linear Transformations
8.2 (10)	2	Kernel and Range
8.4 (10)	2	Matrices of General Linear
Total hours	**6**	

Additional Topics

Text(Week)	Hours	Topic
5 September 2005		**Labour Day**
11.1 (11)	1	Constructing Curves and surfaces through Specified Points
9.2 (11)	1	Geometry of Linear Operators on $\mathbf{R}^2$
Total hours	**2**	

Complex Vector Spaces

Text(Week)	Hours	Topic
10.1 (1)	1	Complex Numbers
10.2 (1)	1	Division of Complex Numbers
10.3 (1)	1	Polar Form of a Complex Number
Total hours	**3**	

Lecture	**57 hours**
Tests	**4 hours**
Holidays	**5 hours**
Total	**66 hours**