

Math 1H03

1. Linear systems of equations – 4 lectures (1.1,1.2,1.3)

- Solutions and Elementary Operations
- Gaussian Elimination
- Homogeneous Equations

2. Matrices – 6 lectures (2.1,2.2,2.3,2.4)

- Matrix Addition, Scalar Multiplication, and Transposition
- Matrix Multiplication
- Matrix Inverses
- Elementary Matrices

3. Determinants – 7 lectures (3.1,3.2,3.3)

- The Laplace Expansion
- Determinants and Matrix Inverses
- Diagonalization and Eigenvalues

4. Vectors in \mathbf{R}^2 and \mathbf{R}^3 – 5 lectures (4.1,4.2,4.3)

- Vectors and Lines
- The Dot Product and Projections
- Planes and the Cross Product

5. The Vector Space \mathbf{R}^n – 7 lectures (5.1,5.2,5.3)

- Subspaces
- Spanning Sets
- Independence
- Dimension
- Rank of a Matrix
- Similarity and Diagonalization (and more on eigenvalues and eigenvectors)

6. Orthogonality – 4 lectures (7.1,7.2)

- Projections
- Gram-Schmidt Process
- Orthogonal Diagonalization (and more on eigenvalues and eigenvectors)

7. Complex Numbers – 3 lectures (Appendix A)

- Addition, Multiplication, Division
- Conjugate, Modulus
- Polar Form
- De Moivre's Theorem and nth roots