1. Introduction: the real and complex numbers, polynomials.

2. Systems of linear equations and Gauss elimination.

3. Vector spaces: examples (Euclidean 2-space and 3-space, function spaces, matrix spaces), basic concepts, basis and dimension of a vector space. Application to systems of linear equations.

4. Inverse matrices, the determinant, scalar products.

5. Linear transformations: kernel and image, the matrix representation of a transformation, change of basis.

6. Eigenvalues, eigenvectors and diagonalization.