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Nota di contenuto	Cover -- Advanced Modern Engineering Mathematics -- Contents -- Preface -- About the Authors -- Publisher's Acknowledgements -- Matrix Analysis -- Introduction -- Review of matrix algebra -- Definitions -- Basic operations on matrices -- Determinants -- Adjoint and inverse matrices -- Linear equations -- Rank of a matrix -- Vector spaces -- Linear independence -- Transformations between bases -- Exercises (1-4) -- The eigenvalue problem -- The characteristic equation -- Eigenvalues and eigenvectors -- Exercises (5-6) -- Repeated eigenvalues -- Exercises (7-9) -- Some useful properties of eigenvalues -- Symmetric matrices -- Exercises (10-13) -- Numerical methods -- The power method -- Gerschgorin circles -- Exercises (14-19) -- Reduction to canonical form -- Reduction to diagonal form -- The Jordan canonical form -- Exercises (20-27) -- Quadratic forms -- Exercises (28-34) -- Functions of a matrix -- Exercises (35-42) -- Singular value decomposition -- Singular values -- Singular value decomposition (SVD) -- Pseudo inverse -- Exercises (43-50) -- State-space representation -- Single-input-single-output (SISO) systems -- Multi-input-multi-output (MIMO) systems -- Exercises (51-55) -- Solution of the state equation -- Direct form of the solution -- The transition matrix -- Evaluating the transition matrix -- Exercises (56-61) -- Spectral representation of response -- Canonical representation -- Exercises (62-68) -- Engineering application: Lyapunov stability

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Transforms of the step and impulse functions.

Sommario/riassunto

Building on the foundations laid in the companion text Modern Engineering Mathematics, this book gives an extensive treatment of some of the advanced areas of mathematics that have applications in various fields of engineering, particularly as tools for computer-based system modelling, analysis and design. The philosophy of learning by doing helps students develop the ability to use mathematics with understanding to solve engineering problems. A wealth of engineering examples and the integration of MATLAB and MAPLE further support students.