1. Record Nr. UNINA9910337642503321

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Titolo	Algebraic and Differential Methods for Nonlinear Control Theory : Elements of Commutative Algebra and Algebraic Geometry / / by Rafael Martínez-Guerra, Oscar Martínez-Fuentes, Juan Javier Montesinos-García
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-12025-2
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (XIV, 196 p. 13 illus., 11 illus. in color.)
Collana	Mathematical and Analytical Techniques with Applications to Engineering, , 1559-7466
Disciplina	620.00151 629.836
Soggetti	Engineering mathematics Nonlinear optics Automatic control System theory Control theory Engineering Mathematics Nonlinear Optics Control and Systems Theory Systems Theory, Control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Mathematical Background -- Group Theory -- Rings -- Matrices and linear equations systems -- Permutations and Determinants -- Vector and Euclidean Spaces -- Linear Transformations -- Matrix Diagonalization and Jordan Canonical Form -- Differential Equations -- Differential Algebra for Nonlinear Control Theory -- Appendix -- Index.
Sommario/riassunto	This book is a short primer in engineering mathematics with a view on applications in nonlinear control theory. In particular, it introduces some elementary concepts of commutative algebra and algebraic geometry which offer a set of tools quite different from the traditional

approaches to the subject matter. This text begins with the study of elementary set and map theory. Chapters 2 and 3 on group theory and rings, respectively, are included because of their important relation to linear algebra, the group of invertible linear maps (or matrices) and the ring of linear maps of a vector space. Homomorphisms and Ideals are dealt with as well at this stage. Chapter 4 is devoted to the theory of matrices and systems of linear equations. Chapter 5 gives some information on permutations, determinants and the inverse of a matrix. Chapter 6 tackles vector spaces over a field, Chapter 7 treats linear maps resp. linear transformations, and in addition the application in linear control theory of some abstract theorems such as the concept of a kernel, the image and dimension of vector spaces are illustrated. Chapter 8 considers the diagonalization of a matrix and their canonical forms. Chapter 9 provides a brief introduction to elementary methods for solving differential equations and, finally, in Chapter 10, nonlinear control theory is introduced from the point of view of differential algebra.