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	Titolo	Ordinary Differential Equations: Basics and Beyond / / by David G. Schaeffer, John W. Cain
	Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2016
	ISBN	1-4939-6389-9
	Edizione	[1st ed. 2016.]
	Descrizione fisica	1 online resource (XXX, 542 p. 139 illus., 61 illus. in color.)
	Collana	Texts in Applied Mathematics, , 0939-2475 ; ; 65
	Disciplina	515.352
	Soggetti	Differential equations
		Mathematical physics
		Dynamics
		Ergodic theory
		Ordinary Differential Equations
		Theoretical, Mathematical and Computational Physics
		Dynamical Systems and Ergodic Theory
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Introduction -- Linear Systems with Constant Coefficients -- Nonlinear Systems: Local Theory -- Nonlinear Systems: Global Theory -- Nondimensionalization and Scaling -- Trajectories Near Equilibria -- Oscillations in ODEs -- Bifurcation from Equilibria -- Examples of Global Bifurcation -- Epilogue -- Appendices.
	Sommario/riassunto	This book develops the theory of ordinary differential equations (ODEs), starting from an introductory level (with no prior experience in ODEs assumed) through to a graduate-level treatment of the qualitative theory, including bifurcation theory (but not chaos). While proofs are rigorous, the exposition is reader-friendly, aiming for the informality of face-to-face interactions. A unique feature of this book is the integration of rigorous theory with numerous applications of scientific interest. Besides providing motivation, this synthesis clarifies the theory and enhances scientific literacy. Other features include: (i) a wealth of exercises at various levels, along with commentary that explains why they matter; (ii) figures with consistent color conventions to identify nullclines, periodic orbits, stable and unstable manifolds;

and (iii) a dedicated website with software templates, problem solutions, and other resources supporting the text. Given its many applications, the book may be used comfortably in science and engineering courses as well as in mathematics courses. Its level is accessible to upper-level undergraduates but still appropriate for graduate students. The thoughtful presentation, which anticipates many confusions of beginning students, makes the book suitable for a teaching environment that emphasizes self-directed, active learning (including the so-called inverted classroom).