

1. Record Nr.	UNINA9910965668603321
Autore	Northrop Robert B.
Titolo	Introduction to complexity and complex systems / / by Robert B. Northrop
Pubbl/distr/stampa	Boca Raton, FL : , : CRC Press, an imprint of Taylor and Francis, , 2010
ISBN	1-4665-0016-6 0-429-11309-9 1-4398-9498-1
Edizione	[First edition.]
Descrizione fisica	1 online resource (542 p.)
Disciplina	570.11
Soggetti	Complexity (Philosophy) Chaotic behavior in systems Biocomplexity
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Front Cover; Contents; Preface; Author; 1. Introduction to Complexity and Complex Systems; 2. Introduction to Large Linear Systems; 3. Introduction to Biochemical Oscillators and Complex, Nonlinear Biochemical Systems; 4. Modularity, Redundancy, Degeneracy, Pleiotropy, and Robustness in Complex Biological Systems; 5. Evolution of Biological Complexity: Invertebrate Immune Systems; 6. Complex Adaptive and Innate Human Immune Systems; 7. Complexity in Quasispecies and MicroRNAs; 8. Introduction to Physiological Complexity: Examples of Models of Some Complex Physiological Systems 9. Quest for Quantitative Measures of Complexity10. "Irreducible" and "Specified Complexity "in Living Systems; 11. Introduction to Complexity in Economic Systems; 12. Dealing with Complexity; Appendix A: Simnon TM Programs Used in Chapters 3 and 8; Appendix B: How to Use Root Locus to Determine the Stability of SISO Linear Control Systems; Appendix C: Bode Plots; Appendix D: Nyquist Plots; Glossary; Bibliography and Related Readings; Back Cover
Sommario/riassunto	The boundaries between simple and complicated, and complicated and complex system designations are fuzzy and debatable, even using

quantitative measures of complexity. However, if you are a biomedical engineer, a biologist, physiologist, economist, politician, stock market speculator, or politician, you have encountered complex systems. Furthermore, your success depends on your ability to successfully interact with and manage a variety of complex systems. In order not to be blindsided by unexpected results, we need a systematic, comprehensive way of analyzing, modeling, and simulating complex systems to predict non-anticipated outcomes. In its engaging first chapters, the book introduces complex systems, Campbell's Law, and the Law of Unintended Consequences, and mathematics necessary for conversations in complex systems. Subsequent chapters illustrate concepts via commonly studied biological mechanisms. The final chapters focus on higher-level complexity problems, and introduce complexity in economic systems. Designed as a reference for biologists and biological engineers, *Introduction to Complexity and Complex Systems* lends itself to use in a classroom course to introduce advanced students studying biomedical engineering, biophysics, or physiology to complex systems. Engaging and illustrative, this book aids scientists and decision makers in managing biological complexity and complex systems.
