

1. Record Nr.	UNINA9910254306903321
Autore	Iannelli Mimmo
Titolo	The Basic Approach to Age-Structured Population Dynamics : Models, Methods and Numerics // by Mimmo Iannelli, Fabio Milner
Pubbl/distr/stampa	Dordrecht : , : Springer Netherlands : , : Imprint : Springer, , 2017
ISBN	94-024-1146-1
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XII, 350 p. 77 illus., 20 illus. in color.)
Collana	Lecture Notes on Mathematical Modelling in the Life Sciences, , 2193-4789
Disciplina	576.58 577.88
Soggetti	Biomathematics Applied mathematics Engineering mathematics Integral equations Differential equations, Partial Genetics and Population Dynamics Applications of Mathematics Integral Equations Partial Differential Equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	1 Why Age Structure? An Introduction -- 2 The Basic Linear Theory -- 3 Numerical Methods for the Linear Model -- 4 The Time-Dependent Case -- 5 Nonlinear Models -- 6 Stability of Equilibria -- 7 Numerical Methods for the Nonlinear Model -- 8 Global Behavior -- 9 Class-Age Structure for Epidemics -- 10 Epidemics and Demography -- A The Laplace Transform -- B Integral Equations Theory. References.
Sommario/riassunto	This book provides an introduction to age-structured population modeling which emphasises the connection between mathematical theory and underlying biological assumptions. Through the rigorous development of the linear theory and the nonlinear theory alongside numerics, the authors explore classical equations that describe the dynamics of certain ecological systems. Modeling aspects are discussed

to show how relevant problems in the fields of demography, ecology, and epidemiology can be formulated and treated within the theory. In particular, the book presents extensions of age-structured modelling to the spread of diseases and epidemics while also addressing the issue of regularity of solutions, the asymptotic behaviour of solutions, and numerical approximation. With sections on transmission models, non-autonomous models and global dynamics, this book fills a gap in the literature on theoretical population dynamics. The Basic Approach to Age-Structured Population Dynamics will appeal to graduate students and researchers in mathematical biology, epidemiology and demography who are interested in the systematic presentation of relevant models and mathematical methods.

---