



# Earthquake Dynamics of Structures, a Primer

By Anil K. Chopra

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## Earthquake Dynamics of Structures, a Primer By Anil K. Chopra

This monograph is an updated and expanded edition of Chopra's classic primer from 1981, *Dynamics of Structures*. It provides the nonspecialist in dynamics of structures with the basic concepts and knowledge needed to understand the response of structures to earthquake excitation. It presents structural dynamics concepts and analysis procedures in elastic and inelastic response of structures that in one form or the other are utilized in design codes and seismic evaluations guidelines. Its three parts are composed of (1) Linearly Elastic Systems, (2) Inelastic Systems, and (3) Building Design Codes and Evaluation Guidelines. Part I presents a modern treatment of the dynamics of elastic systems. Part II is devoted to the dynamics of inelastic single-degree-of-freedom systems, response spectra for inelastic systems, inelastic design spectrum and its applications in the design of new structures, and safety evaluation of existing structures. It also is an introduction to the vast subject of inelastic analysis and response of multistory buildings. Part III presents the lateral forces specified in the 2003 International Building Code, together with their relationship to the structural dynamics concepts; pertinent comments on three other building codes are included. Part III also discusses selected aspects of computing seismic demands according to FEMA and ATC guidelines for evaluating existing buildings, in light of structural dynamics theory.

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#### **About the Author**

Anil K. Chopra is a professor of engineering in the Department of Civil and Environmental Engineering at the University of California, Berkeley. Professor Chopra's research activities have included studies of structural dynamics, various problems in earthquake analysis and design of buildings, dynamic soil-structure interaction, dynamic fluid-structure interaction, and earthquake analysis and design of concrete dams. He has authored more than 300 published papers on this work, including the monograph, *Earthquake Dynamics of Structures, A Primer*, 1981 and 2005; and a textbook, *Earthquake Dynamics of Structures: Theory and Applications to Earthquake Engineering*, 1995 and 2001.

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