



# Theory of Vibration: An Introduction (Mechanical Engineering Series)

By A.A. Shabana

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The aim of this book is to impart a sound understanding, both physical and mathematical, of the fundamental theory of vibration and its applications. The book presents in a simple and systematic manner techniques that can easily be applied to the analysis of vibration of mechanical and structural systems. Unlike other texts on vibrations, the approach is general, based on the conservation of energy and Lagrangian dynamics, and develops specific techniques from these foundations in clearly understandable stages. Suitable for a one-semester course on vibrations, the book presents new concepts in simple terms and explains procedures for solving problems in considerable detail.

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### **Editorial Review**

#### **Review**

"The text is particularly easy to read and moves from one section to the next with no major changes in style. It is obvious that the structure of the material is...based on a set of mature class notes...a very worthwhile addition to the vibration literature" - Proceedings of the Institution of Mechanical Engineers

#### **From the Back Cover**

Mechanical engineering, an engineering discipline borne of the needs of the industrial revolution, is once again asked to do its substantial share in the call for industrial renewal. The general call is urgent as we face profound issues of productivity and competitiveness that require engineering solutions, among others. 'The Mechanical Engineering' Series features graduate texts and research monographs intended to address the need for information in contemporary areas of mechanical engineering.

#### **About the Author**

Ahmed Shabana was named the Richard and Loan Hill Professor in the Mechanical and Industrial Engineering Department at the University of Illinois at Chicago's College of Engineering. He received his Ph.D. from the University of Iowa in 1982 and worked as a postdoctoral Fellow there before joining UIC in Fall 1983. He is internationally known for his research contributions in the areas of large-scale computations as applied to dynamic and multibody systems such as vehicles, machines, and robots. Professor Shabana is the author of four books and has published more than 260 papers including 130 journal papers and 130 conference papers, presentations, and technical reports. He has maintained, over the years, a steady stream of research funding (a total of \$3.5 million) from the Federal Railroad Administration, Army Research Office and National Science Foundation, as well as other agencies and companies. In addition, Professor Shabana has supervised the work of 31 Ph.D. students, 30 MS students and 26 visiting scholars and postdoctoral Fellows. He has served on the editorial board of several journals, and he is the Founding Chair of the ASME Technical Committee on Multi-Body Systems and Nonlinear Dynamics. He has also served as a member of several national and international committees. He is a Fellow of the American Society of Mechanical Engineers (ASME). Professor Shabana received several awards, which include an Honorary Doctorate Degree from Lappeenranta University of Technology (Finland), the Fulbright Research Scholar Award, and the Humboldt Prize.

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