



Applied Structural and Mechanical Vibrations: Theory and Methods, 2/e

Paolo L. Gatti

2014

668 pp

Hardback

ISBN: 9780415565783

Price: 10,270.00

About the Book

The second edition of Applied Structural and Mechanical Vibrations: Theory and Methods continues the first edition's dual focus on the mathematical theory and the practical aspects of engineering vibrations measurement and analysis. This book emphasises the physical concepts, brings together theory and practice, and includes a number of worked-out examples of varying difficulty and an extensive list of references. What's New in the Second Edition: Adds new material on response spectra Includes revised chapters on modal analysis and on probability and statistics Introduces new material on stochastic processes and random vibrations The book explores the theory and methods of engineering vibrations. By also addressing the measurement and analysis of vibrations in real-world applications, it provides and explains the fundamental concepts that form the common background of disciplines such as structural dynamics, mechanical, aerospace, automotive, earthquake, and civil engineering. Applied Structural and Mechanical Vibrations: Theory and Methods presents the material in order of increasing complexity. It introduces the simplest physical systems capable of vibratory motion in the fundamental chapters, and then moves on to a detailed study of the free and forced vibration response of more complex systems. It also explains some of the most important approximate methods and experimental techniques used to model and analyze these systems. With respect to the first edition, all the material has been revised and updated, making it a superb reference for advanced students and professionals working in the field.

Salient Features

Brings together theory, methodology, and practice for the practising engineer

Provides a unique combination of the author's experience—a nuclear physicist who has been working for more than 20 years in the field of engineering vibrations

Includes many worked examples based also on real cases from the author's experience

Table of Contents

Review of some fundamentals

Mathematical preliminaries

Analytical mechanics: An overview

Single degree of freedom systems

More SDOF systems: Shock response, transient response and some approximate methods

Multiple degrees of freedom (MDOF) systems

More MDOF systems: Forced vibration and response analysis

Continuous systems

MDOF and continuous systems: Approximate methods

Experimental modal analysis

Probability and statistics: Preliminaries to random vibrations

Stochastic processes and random vibrations

About the Author

- Paolo L. Gatti graduated in nuclear physics from the State University of Milano (Italy) and worked for 12 years for a private engineering company, where he became head of the vibration testing and data acquisition department. Since 2000, he has worked as an independent consultant in mechanical and structural vibrations, acoustics, and statistical analyses of experimental data. In these fields of activity, he is also an accredited technical consultant for the Court of Justice of Milan. He is also the author of Probability Theory and Mathematical Statistics for

Engineers, published by Spon Press (Taylor & Francis Group) in 2005.