



# Applied Structural and Mechanical Vibrations: Theory and Methods, Second Edition

By Paolo L. Gatti

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**Applied Structural and Mechanical Vibrations: Theory and Methods, Second Edition** By Paolo L. Gatti

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.

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**Applied Structural and Mechanical Vibrations: Theory and Methods, Second Edition** By Paolo L. Gatti Bibliography

- Rank: #6353989 in Books
- Published on: 2014-02-25
- Original language: English
- Number of items: 1
- Dimensions: 9.20" h x 1.60" w x 6.30" l, .0 pounds
- Binding: Hardcover
- 668 pages

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### Review

"... this book is a good reference book to have on the shelf to refresh your memory about some aspects of vibrations or to find a reference to deepen your understanding. It is also a good book for people – like physicists or electrical engineers – who have a technical background but not in this area of mechanical engineering."

*Noise Control Engineering Journal*

"The book is very well written and could be considered as quite different from earlier books on the topic, and can be recommended for graduate research level students as well as practicing engineers."

*Journal of Structural Engineering*

"An excellent addition to the literature. Upper-division undergraduates through professionals."

*Choice*

"This reviewer recommends this book strongly for use in universities libraries and laboratories involved in vibration measurements."

*Applied Mechanics Reviews*

"The book is well written and structured, and is a good reference book"

*The Structural Engineer*

"This book provides students, researchers and engineers with a concise and comprehensive introduction to mechanical and structural vibrations. It gives methods for solving problems in this field of area but opens doors to experimental vibration analysis and random vibrations. ... This book provides a background in techniques and methods and sounds guidelines and understanding of theoretical concepts in vibration analysis."

*Christian Cremona, Sétra/CTOA, France*

### 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.

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