



Mechanical Systems: A Unified Approach to Vibrations and Controls

By Roger F. Gans

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This essential textbook concerns analysis and control of engineering mechanisms, which includes almost any apparatus with moving parts used in daily life, from musical instruments to robots. A particular characteristic of this book is that it presents with considerable breadth and rigor both vibrations and controls. Many contemporary texts combine both of these topics in a single, one term course. This text supports the more favorable circumstance where the material is covered in a one year sequence contains enough material for a two semester sequence, but it can also be used in a single semester course combining two topics. “Mechanical Systems: A Unified Approach to Vibrations and Controls” presents a common notation and approach to these closely related areas. Examples from the both vibrations and controls components are integrated throughout this text.

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Editorial Review

From the Back Cover

This essential textbook covers analysis and control of engineering mechanisms, which include almost any apparatus with moving parts used in daily life, from musical instruments to robots. The text presents both vibrations and controls with considerable breadth and depth using a unified notation. It strikes a nice balance between the analytical and the practical. This text contains enough material for a two semester sequence, but it can also be used in a single semester course combining the two topics. *Mechanical Systems: A Unified Approach to Vibrations and Controls* presents a common notation and approach to these closely related areas. Examples from the both vibrations and controls components are integrated throughout this text.

This book also:

- Presents a unified approach to vibrations and controls, including an excellent diagram that simultaneously discusses embedding classical vibrations (mechanical systems) in a discussion of models, inverse models, and open and closed loop control
- Makes a careful connection of the Lagrangian approach and state space
- Introduces the reader to a formal approach to linearization, something that every engineering student should know, but which is not included in many programs or undergraduate textbooks
- Discusses simulation of nonlinear systems for comparison with and evaluation of the usual linear approximations
- Features a concise discussion of DC motors, affording a more realistic approach to controls using voltage inputs instead of disembodied forces and torques
- Includes a final chapter that addresses feedback linearization generally and in the context of robots with purely revolute joints

About the Author

Dr. Roger Gans is Professor Emeritus of Mechanical Engineering at the University of Rochester

Users Review

From reader reviews:

Rose Villegas:

As people who live in the actual modest era should be revise about what going on or info even knowledge to make them keep up with the era and that is always change and progress. Some of you maybe will certainly update themselves by examining books. It is a good choice for yourself but the problems coming to you is you don't know which one you should start with. This Mechanical Systems: A Unified Approach to Vibrations and Controls is our recommendation to help you keep up with the world. Why, since this book serves what you want and need in this era.

Kathy Vaughn:

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