



# Dynamics of Physical Systems (Dover Civil and Mechanical Engineering)

By Robert H. Jr. Cannon

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A comprehensive text and reference for a first study of system dynamics and control, this volume emphasizes engineering concepts — modeling, dynamics feedback, and stability, for example — rather than mechanistic analysis procedures designed to yield routine answers to programmable problems. Its focus on physical modeling cultivates an appreciation for the breadth of dynamic systems without resorting to analogous electric-circuit formulation and analysis. After a careful treatment of the modeling of physical systems in several media and the derivation of the differential equations of motion, the text determines the physical behavior those equations connote: the free and forced motions of elementary systems and compound "systems of systems." Dynamic stability and natural behavior receive comprehensive linear treatment, and concluding chapters examine response to continuing and abrupt forcing inputs and present a fundamental treatment of analysis and synthesis of feedback control systems. This text's breadth is further realized through a series of examples and problems that develop physical insight in the best traditions of modern engineering and lead students into richer technical ground.

As presented in this book, the concept of dynamics forms the basis for understanding not only physical devices, but also systems in such fields as management and transportation. Indeed, the fundamentals developed here constitute the common language of engineering, making this text applicable to a wide variety of undergraduate and graduate courses. 334 figures. 12 tables.

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