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Titolo	Introduction to Aeroelasticity : With Case-Studies // by Harijono Djojodihardjo
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Soggetti	Fluid mechanics Aerospace engineering Astronautics Materials Fluidics Engineering Fluid Dynamics Aerospace Technology and Astronautics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Part I Foundation of Aeroelasticity -- Introduction -- Fundamental Concepts from Theory of Elasticity -- Static Aeroelasticity -- Flutter Stability -- Introduction to Dynamic Aeroelasticity -- Unsteady Aerodynamic Forces on Oscillating Airfoils in Compressible Flow -- Unsteady Aerodynamics of Lifting and Non-Lifting Surfaces -- Dynamic Aeroelasticity -- Flutter Calculation Method -- Part II Application Examples and Case Studies -- Analysis and Parametric Study of Aircraft Wings for Aeroelastic Stability and Flutter Characteristics -- Acoustic Effects on Binary Aeroelastic Model -- Optimization of Tapered Wing with Aeroelastic Constraints -- Application of Artificial Neural Networks on Flutter Suppression System -- Aeroelastic and Performance Baseline Analysis of Piezo-Aeroelastic Wing -- Baseline Aeroelastic and Performance Analysis of Piezo-Aeroelastic Space-Structure for Energy Harvester -- Kinematic and Unsteady Aerodynamic Study on Bi- and Quad-Wing Ornithopter -- Analysis and Computational Study of The Aerodynamics and Aeroelasticity of Generic Flapping Wings -- BEM-FEM Coupling for Acoustic Effects on Aeroelastic Stability of Structures

-- Vibro-Acoustic Analysis of the Acoustic-Structure Interaction of Flexible Structure Due to Acoustic Excitation -- State Space Aeroelastic Analysis of an Aircraft with Stand-By Actuator.

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Sommario/riassunto

This textbook is intended as a core text for courses on aeroelasticity or aero-elasto-mechanics for senior undergraduate/graduate programs in aerospace and mechanical engineering. The book focuses on the basic understanding of the concepts required in learning about aeroelasticity, from observation, reasoning, and understanding fundamental physical principles. Fundamental and simple mathematics will be introduced to describe the features of aeroelastic problems, and to devise simple concurrent physical and mathematical modeling. It will be accompanied by the introduction and understandings of the mechanisms that create the interactions that generate the aeroelastic phenomena considered. The students will also be led to the relation between observed phenomena, assumptions that may have to be adopted to arrive at physical and mathematical modelling, interpreting and verifying the results, and the accompanied limitations, uncertainties and inaccuracies. The students will also be introduced to combine engineering problem solving attitude and determination with simple mechanics problem-solving skills that coexist harmoniously with a useful mechanical intuition.

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