1. Record Nr. UNINA9911018961003321

Titolo	Vibrations of continuous mechanical systems / / Peter Hagedorn, Anirvan DasGupta
Pubbl/distr/stampa	Chichester, West Sussex, : John Wiley & Sons Ltd., 2007
ISBN	9786611135331 9781281135339 128113533X 9780470518434 047051843X 9780470518427 0470518421
Descrizione fisica	1 online resource (398 p.)
Altri autori (Persone)	HagedornPeter DasGuptaAnirvan
Disciplina	620.3
Soggetti	Vibration
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	Vibrations and Waves in Continuous Mechanical Systems; Contents; Preface; 1 Vibrations of strings and bars; 1.1 Dynamics of strings and bars: the Newtonian formulation; 1.1.1 Transverse dynamics of strings; 1.1.2 Longitudinal dynamics of bars; 1.1.3 Torsional dynamics of bars; 1.2 Dynamics of strings and bars: the variational formulation; 1.2.1 Transverse dynamics of strings; 1.2.2 Longitudinal dynamics of bars; 1.2.3 Torsional dynamics of bars; 1.3 Free vibration problem: Bernoulli's solution; 1.4 Modal analysis; 1.4.1 The eigenvalue problem; 1.4.2 Orthogonality of eigenfunctions 1.4.3 The expansion theorem1.4.4 Systems with discrete elements; 1.5 The initial value problem: solution using Laplace transform; 1.6 Forced vibration analysis; 1.6.1 Harmonic forcing; 1.6.2 General forcing; 1.7 Approximate methods for continuous systems; 1.7.1 Rayleigh method; 1.7.2 Rayleigh-Ritz method; 1.7.3 Ritz method; 1.7.4 Galerkin method; 1.8 Continuous systems with damping; 1.8.1 Systems with distributed damping; 1.8.2 Systems with discrete damping; 1.9 Non-homogeneous

Sommario/riassunto

The subject of vibrations is of fundamental importance in engineering and technology. Discrete modelling is sufficient to understand the dynamics of many vibrating systems; however a large number of vibration phenomena are far more easily understood when modelled as continuous systems. The theory of vibrations in continuous systems is crucial to the understanding of engineering problems in areas as diverse as automotive brakes, overhead transmission lines, liquid filled tanks, ultrasonic testing or room acoustics. Starting from an elementary level, Vibrations and Waves in Continuous Me