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about an equilibrium configuration corresponding to steady motion; 2.1.3 Vibrations about a neutrally stable equilibrium position; 2.2 Normal modes of vibration; 2.2.1 Systems with a stable equilibrium configuration; 2.2.2 Systems with a neutrally stable equilibrium position; 2.3 Orthogonality of vibration eigenmodes; 2.3.1 Orthogonality of elastic modes with distinct frequencies; 2.3.2 Degeneracy theorem and generalized orthogonality relationships 2.3.3 Orthogonality relationships including rigid-body modes2.4 Vector and matrix spectral expansions using eigenmodes; 2.5 Free vibrations induced by nonzero initial conditions; 2.5.1 Systems with a stable equilibrium position; 2.5.2 Systems with neutrally stable equilibrium position; 2.6 Response to applied forces: forced harmonic response; 2.6.1 Harmonic response, impedance and admittance matrices; 2.6.2 Mode superposition and spectral expansion of the admittance matrix; 2.6.3 Statically exact expansion of the admittance matrix; 2.6.4 Pseudo-resonance and resonance
2.6.5 Normal excitation modes2.7 Response to applied forces: response in the time domain; 2.7.1 Mode superposition and normal equations; 2.7.2 Impulse response and time integration of the normal equations; 2.7.3 Step response and time integration of the normal equations; 2.7.4 Direct integration of the transient response; 2.8 Modal approximations of dynamic responses; 2.8.1 Response truncation and mode displacement method; 2.8.2 Mode acceleration method; 2.8.3 Mode acceleration and model reduction on selected coordinates; 2.9 Response to support motion
2.9.1 Motion imposed to a subset of degrees of freedom

Sommario/riassunto

"Mechanical Vibrations: Theory and Application to Structural Dynamics, Third Edition is a comprehensively updated and reorganized new edition of the popular textbook. It presents the theory of vibrations in the context of structural analysis and covers applications in mechanical and aerospace engineering, This new edition now includes the fundamentals of signal processing and identification technique, and develops the concepts of dynamic reduction and substructuring.A more detailed discussion of the concept of eigensolution sensitivity to physical parameters is included and the fundamental cases of wave propagation in solids are considered. It also includes a chapter on the finite element method for one-dimensional structures.This new edition contains coherent and uniform notation and now includes solved exercises at the end of each chapter"--