

1. Record Nr.	UNINA9910826708303321
Autore	Sen Tapan K
Titolo	Fundamentals of seismic loading on structures // by Tapan K. Sen
Pubbl/distr/stampa	Chichester, West Sussex, U.K. ; ; Hoboken, NJ, : Wiley, 2009
ISBN	1-282-12333-5 9786612123337 0-470-74234-8 0-470-74235-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (406 p.)
Disciplina	624.1/762
Soggetti	Earthquake resistant design Earthquake hazard analysis Strains and stresses
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Fundamentals of Seismic Loading on Structures; Contents; Preface; Acknowledgements; 1 Introduction to Earthquakes; 1.1 A Historical Perspective; 1.1.1 Seismic Areas of the World; 1.1.2 Types of Failure; 1.1.3 Fault Movement and its Destructive Action; 1.2 The Nature of Earthquakes; 1.3 Plate Tectonics; 1.3.1 Types of Plate Boundaries; 1.3.2 Convergent and Divergent Boundaries; 1.3.3 Seismicity and Plate Tectonics; 1.4 Focus and Epicentre; 1.5 Seismic Waves; 1.5.1 Body Waves; 1.5.2 Surface Waves; 1.6 Seismometers; 1.6.1 Early Seismographs; 1.6.2 Modern Developments 1.6.3 Locating the Epicentre 1.7 Magnitude and Intensity; 1.7.1 Magnitude Scales; 1.7.2 Seismic Moment; 1.7.3 Intensity Scales; 1.8 Reid's Elastic Rebound Theory; 1.9 Significant Milestones in Earthquake Engineering; 1.10 Seismic Tomography; 1.10.1 The Challenges Ahead; 1.11 References; 2 Single Degree of Freedom Systems; 2.1 Introduction; 2.2 Free Vibration; 2.2.1 Equations of Motion with Damping; 2.2.2 Damping Ratio; 2.2.3 Treatment of Initial Conditions; 2.3 Periodic Forcing Function; 2.3.1 Magnification Factors; 2.3.2 Damping; 2.3.3 Support Motion; 2.4 Arbitrary Forcing Function 2.4.1 Duhamel Integral 2.4.2 Numerical Evaluation; 2.4.3 Worked

Example - Duhamel Integral; 2.5 References; 3 Systems with Many Degrees of Freedom; 3.1 Introduction; 3.2 Lumped Parameter Systems with Two Degrees of Freedom; 3.3 Lumped Parameter Systems with more than Two Degrees of Freedom; 3.3.1 Free Vibration; 3.3.2 A Worked Example (Two degrees of Freedom System); 3.3.3 Normalization of Mode Shapes; 3.3.4 Orthogonality of Mode Shapes; 3.3.5 Worked Example - Orthogonality Check; 3.4 Mode Superposition; 3.4.1 Use of Normal or Generalized Coordinates; 3.5 Damping Orthogonality
3.6 Non-linear Dynamic Analysis
3.6.1 Introduction; 3.6.2 Incremental Integration Process; 3.6.3 Numerical Procedures for Integration; 3.6.4 Estimate of Errors; 3.6.5 Houbolt's Method; 3.6.6 Explicit and Implicit Scheme; 3.6.7 Minimum Time Step t (Explicit Integration Scheme); 3.7 References; 4 Basics of Random Vibrations; 4.1 Introduction; 4.2 Concepts of Probability; 4.2.1 Random Variable Space; 4.2.2 Gaussian or Normal Distribution; 4.2.3 Worked Example with Standard Normal Variable; 4.3 Harmonic Analysis; 4.3.1 Introduction; 4.3.2 Fourier Series (Robson, 1963)
4.3.3 Fourier Integrals (Robson, 1963, with permission)
4.3.4 Spectral Density (Robson, 1963); 4.4 Numerical Integration Scheme for Frequency Content; 4.4.1 Introducing Discrete Fourier Transform (DFT); 4.5 A Worked Example (Erzincan, 1992); 4.6 References; 5 Ground Motion Characteristics; 5.1 Characteristics of Ground Motion; 5.1.1 Ground Motion Particulars; 5.1.2 After Shocks and Before Shocks; 5.1.3 Earthquake Source Model; 5.1.4 Empirical Relations of Source Parameters; 5.2 Ground Motion Parameters; 5.2.1 The Nature and Attenuation of Ground Motion
5.2.2 PGA and Modified Mercalli Intensity (MMI)

Sommario/riassunto

This book provides a practical guide to the basic essentials of earthquake engineering with a focus on seismic loading and structural design. Benefiting from the author's extensive career in structural and earthquake engineering, dynamic analysis and lecturing, it is written from an industry perspective at a level suitable for graduate students. Fundamentals of Seismic Loading on Structures is organised into four major sections: introduction to earthquakes and related engineering problems, analysis, seismic loading, and design concepts. From a practical perspective, reviews lin
