File Type PDF Earthquake Engineering Ebooks

This is likewise one of the factors by obtaining the soft documents of this **Earthquake Engineering Ebooks** by online. You might not require more time to spend to go to the books launch as with ease as search for them. In some cases, you likewise get not discover the declaration Earthquake Engineering Ebooks that you are looking for. It will definitely squander the time.

However below, bearing in mind you visit this web page, it will be fittingly unquestionably simple to acquire as capably as download lead Earthquake Engineering Ebooks

It will not admit many period as we explain before. You can reach it even though take action something else at house and even in your workplace. appropriately easy! So, are you question? Just exercise just what we provide under as competently as review **Earthquake Engineering Ebooks** what you in imitation of to read!

PZ9UIL - BLEVINS TOWNSEND

This one-stop resource--filled with in--depth earthquake engineering analysis, testing procedures, seismic and construction codes--features new coverage of the 2012 International Building Code.
While successfully preventing earthquakes may still be beyond the capacity of modern engineering, the ability to mitigate damages with strong structural designs and other mitigation measures are well within the purview of science. Fundamental Concepts of Earthquake Engineering presents the concepts, procedures, and code provisions that are currentl
A comprehensive book focusing on the Force Analogy Method, a novel method for nonlinear dynamic analysis and simulation This book focusses on the Force Analogy Method, a novel method for nonlinear dynamic analysis and simulation. A review of the current nonlinear analysis method for earthquake engineering will be summarized and explained. Addi-

tionally, how the force analogy method can be used in nonlinear static analysis will be discussed through several nonlinear static examples. The emphasis of this book is to extend and develop the force analogy method to performing dynamic analysis on structures under earthquake excitations, where the force analogy method is incorporated in the flexural element, axial element, shearing element and so on will be exhibited. Moreover, the geometric nonlinearity into nonlinear dynamic analysis algorithm based on the force analogy method is included. The application of the force analogy method in seismic design for buildings and structural control area is discussed and combined with practical engineering.
This book provides an insight on advanced methods and concepts for the design and analysis of structures against earthquake loading. This second volume is a collection of 28 chapters written by leading experts in the field of structural

analysis and earthquake engineering. Emphasis is given on current state-of-the-art methods and concepts in computing methods and their application in engineering practice. The book content is suitable for both practicing engineers and academics, covering a wide variety of topics in an effort to assist the timely dissemination of research findings for the mitigation of seismic risk. Due to the devastating socioeconomic consequences of seismic events, the topic is of great scientific interest and is expected to be of valuable help to scientists and engineers. The chapters of this volume are extended versions of selected papers presented at the COMPDYN 2011 conference, held in the island of Corfu, Greece, under the auspices of the European Community on Computational Methods in Applied Sciences (ECCOMAS).

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions contains invited, keynote and theme lectures and regular papers presented at the 7th International Conference on Earthquake Geotechnical Engineering (Rome, Italy, 17-20 June 2019. The contributions deal with recent developments and advancements as well as case histories, field monitoring, experimental characterization, physical and analytical modelling, and applications related to the variety of environmental phenomena induced by earthquakes in soils and their effects on engineered systems interacting with them. The book is divided in the sections below: Invited papers Keynote papers Theme lectures Special Session on Large Scale Testing Special Session on Liquefact Projects Special Session on Lessons learned from recent earthquakes Special Session on the Central Italy earthquake Regular papers Earthquake Geotechnical

Engineering for Protection and Development of Environment and Constructions provides a significant up-to-date collection of recent experiences and developments, and aims at engineers, geologists and seismologists, consultants, public and private contractors, local national and international authorities, and to all those involved in research and practice related to Earthquake Geotechnical Engineering.

This volume comprises papers presented at the China-US Millennium Symposium on Earthquake Engineering, held in Beijing, China, on November 8-11, 2000. This conference provides a forum for advancing the field of earthquake engineering through multi-lateral cooperation.

A comprehensive guide to modern-day methods for earthquake engineering of concrete dams Earthquake analysis and design of concrete dams has progressed from static force methods based on seismic coefficients to modern procedures that are based on the dynamics of dam–water–foundation systems. Earthquake Engineering for Concrete Dams offers a comprehensive, integrated view of this progress over the last fifty years. The book offers an understanding of the limitations of the various methods of dynamic analysis used in practice and develops modern methods that overcome these limitations. This important book: Develops procedures for dynamic analysis of two-dimensional and three-dimensional models of concrete dams Identifies system parameters that influence their response Demonstrates the effects of dam–water–foundation interaction on earthquake response Identifies factors that must be included in earthquake analysis of concrete dams Examines design earthquakes as defined by various regulatory bodies and organizations Presents modern methods for establishing design

spectra and selecting ground motions Il-lustrates application of dynamic analysis procedures to the design of new dams and safety evaluation of existing dams. Written for graduate students, research-ers, and professional engineers, Earth-quake Engineering for Concrete Dams offers a comprehensive view of the cur-rent procedures and methods for seismic analysis, design, and safety evaluation of concrete dams.

This book is intended primarily as a text-book for students studying structural en-gineering. It covers three main areas in the analysis and design of structural sys-tems subjected to seismic loading: basic seismology, basic structural dynamics, and code-based calculations used to de-termine seismic loads from an equiva-lent static method and a dynamic-s-based method. It provides students with the skills to determine seismic effects on structural systems, and is unique in that it combines the fundamen-tals of structural dynamics with the lat-est code specifications. Each chapter con-tains electronic resources: image gal-leries, PowerPoint presentations, a solu-tions manual, etc.

Given the risk of earthquakes in many countries, knowing how structural dy-namics can be applied to earthquake en-gineering of structures, both in theory and practice, is a vital aspect of improv-ing the safety of buildings and struc-tures. It can also reduce the number of deaths and injuries and the amount of property damage. The book begins by discussing free vibration of single-de-gree-of-freedom (SDOF) systems, both damped and undamped, and forced vi-bration (harmonic force) of SDOF sys-tems. Response to periodic dynamic load-ings and impulse loads are also dis-cussed, as are two degrees of freedom

linear system response methods and free vibration of multiple degrees of free-dom. Further chapters cover time history response by natural mode superposition, numerical solution methods for natural frequencies and mode shapes and differ-ential quadrature, transformation and Fi-nite Element methods for vibration problems. Other topics such as earth-quake ground motion, response spectra and earthquake analysis of linear sys-tems are discussed. Structural dynamics of earthquake engineering: theory and application using Mathematica and Mat-lab provides civil and structural engi-neers and students with an understand-ing of the dynamic response of struc-tures to earthquakes and the common analysis techniques employed to evalu-ate these responses. Worked examples in Mathematica and Matlab are given. Ex-plains the dynamic response of struc-tures to earthquakes including periodic dynamic loadings and impulse loads Ex-amines common analysis techniques such as natural mode superposition, the finite element method and numerical so-lutions Investigates this important topic in terms of both theory and practise with the inclusion of practical exercise and di-agrams

This concise work provides a general in-troduction to the design of buildings which must be resistant to the effect of earthquakes. A major part of this design involves the building structure which has a primary role in preventing serious dam-age or structural collapse. Much of the material presented in this book ex-amines building structures. Due to the re-cent discovery of vertical components, it examines not only the resistance to later-al forces but also analyses the disastrous influence of vertical components. The work is written for Practicing Civil, Struc-tural, and Mechanical Engineers, Seismol-

ogists and Geoscientists. It serves as a knowledge source for graduate students and their instructors.

Earthquakes are nearly unique among natural phenomena - they affect virtually everything within a region, from massive buildings and bridges, down to the furnishings within a home. Successful earthquake engineering therefore requires a broad background in subjects, ranging from the geologic causes and effects of earthquakes to understanding the imp

Despite advances in the field of geotechnical earthquake engineering, earthquakes continue to cause loss of life and property in one part of the world or another. The Third International Conference on Soil Dynamics and Earthquake Engineering, Princeton University, Princeton, New Jersey, USA, 22nd to 24th June 1987, provided an opportunity for participants from all over the world to share their expertise to enhance the role of mechanics and other disciplines as they relate to earthquake engineering. The edited proceedings of the conference are published in four volumes. This volume covers: Seismicity and Tectonics in the Eastern Mediterranean, Seismic Waves in Soils and Geophysical Methods, Engineering Seismology, Dynamic Methods in Soil and Rock Mechanics, and Ground Motion. With its companion volumes, it is hoped that it will contribute to the further development of techniques, methods and innovative approaches in soil dynamics and earthquake engineering.

Seismic Risk and Engineering Decisions attempts to bridge the gap in decision making between earthquake characteristics and structural behavior. The book begins by providing the background on earthquake generation and characteristics. It reviews the present state of matters in seismicity assessment and treats uncertainties explicitly. The impact of earthquakes on large bodies of water and structures is also discussed. These discussions set the stage for the final part of the book, which deals with the principles and implications of seismic design decision analysis. The book also delves into the selection of instruments for seismological research and engineering applications, with emphasis on widely used conventional seismological equipment. This book is intended to help experienced consulting engineers in assessing seismic risk and making rational decisions when locating and designing important engineering works and when drafting building codes and land use regulations. It will also provide advanced students of engineering with bases for benefiting from his future experience.

Developments in Earthquake Engineering have focussed on the capacity and response of structures. They often overlook the importance of seismological knowledge to earthquake-proofing of design. It is not enough only to understand the anatomy of the structure, you must also appreciate the nature of the likely earthquake. Seismic design, as detailed in this book, is the bringing together of Earthquake Engineering and Engineering Seismology. It focuses on the seismological aspects of design – analyzing various types of earthquake and how they affect structures differently. Understanding the distinction between these earthquake types and their different impacts on buildings can make the difference between whether a building stands or falls, or at least to how much it costs to repair. Covering the basis and basics of the major international codes, this is the essential guide for professionals working on structures in earthquake zones around the world.

This book introduces practising engi-

neers and post-graduate students to modern approaches to seismic design, with a particular focus on reinforced concrete structures, earthquake resistant design of new buildings and assessment, repair and strengthening of existing buildings.

An Original Source of Expressions and Tools for the Design of Concrete Elements with Eurocode Seismic design of concrete buildings needs to be performed to a strong and recognized standard. Eurocode 8 was introduced recently in the 30 countries belonging to CEN, as part of the suite of Structural Eurocodes, and it represents the first European Standard for seismic design. It is also having an impact on seismic design standards in countries outside Europe and will be applied there for the design of important facilities. This book: Contains the fundamentals of earthquakes and their effects at the ground level, as these are affected by local soil conditions, with particular reference to EC8 rules Provides guidance for the conceptual design of concrete buildings and their foundations for earthquake resistance Overviews and exemplifies linear and nonlinear seismic analysis of concrete buildings for design to EC8 and their modelling Presents the application of the design verifications, member dimensioning and detailing rules of EC8 for concrete buildings, including their foundations Serves as a commentary of the parts of EC8 relevant to concrete buildings and their foundations, supplementing them and explaining their proper application Seismic Design of Concrete Buildings to Eurocode 8 suits graduate or advanced undergraduate students, instructors running courses on seismic design and practicing engineers interested in the sound application of EC8 to concrete buildings. Alongside simpler exam-

ples for analysis and detailed design, it includes a comprehensive case study of the conceptual design, analysis and detailed design of a realistic building with six stories above grade and two basements, with a complete structural system of walls and frames. Homework problems are given at the end of some of the chapters.

A unified presentation of engineering seismology and earthquake-resistant design, this book presents a wide ranging coverage of the whole subject of earthquake engineering so that the reader is given a clear appreciation of earthquakes before dealing with their effects on structures. In addition, newer mathematical modelling techniques are introduced which can be powerful tools for assessing and dealing with the risks associated with design and construction in seismic regions.

This work is an elementary but comprehensive textbook which provides the latest updates in the fields of Earthquake Engineering, Dynamics of Structures, Seismology and Seismic Design, introducing relevant new topics to the fields such as the Neodeterministic method. Its main purpose is to illustrate the application of energy methods and the analysis in the frequency domain with the corresponding visualization in the Gauss-Argant plan. However, emphasis is also given to the applications of numerical methods for the solution of the equation of motion and to the ground motion selection to be used in time history analysis of structures. As supplementary materials, this book provides "OPENSIGNAL", a rare and unique software for ground motion selection and processing that can be used by professionals to select the correct earthquake records that would run in the nonlinear analysis. The book con-

tains clear illustrations and figures to describe the subject in an intuitive way. It uses simple language and terminology and the math is limited only to cases where it is essential to understand the physical meaning of the system. Therefore, it is suitable also for those readers who approach these subjects for the first time and who only have a basic understanding of mathematics (linear algebra) and static analysis of structures.

"In order to reduce the seismic risk facing many densely populated regions worldwide, including Canada and the United States, modern earthquake engineering should be more widely applied. But current literature on earthquake engineering may be difficult to grasp for structural engineers who are untrained in seismic design. In addition no single resource addressed seismic design practices in both Canada and the United States until now. Elements of Earthquake Engineering and Structural Dynamics was written to fill the gap. It presents the key elements of earthquake engineering and structural dynamics at an introductory level and gives readers the basic knowledge they need to apply the seismic provisions contained in Canadian and American building codes."--Résumé de l'éditeur.

by Julius S6lnes An Advanced Study Institute on engineering seismology and earthquake engineering was held in Izrrir, 'rurkey July 2-13, 1973 under the auspices of the Scientific Affairs Division of NATO. The Institute was organized by an organizing committee headed by the two scientific directors and with representation by the Turkish National Science Foundation, Turkish National Committee for Earthquake Engineering, the Middle East Technical University and the Aegean University. 93 scientists and engineers of 18 countries took part in the work of the Institute which comprised 10 working days with lectures, discussions and panel meetings. The main lecture topics of the Institute were covered in five main sections: 1. Generic causes of earthquakes. 2. Ground motion and foundation response. 3. Earthquake response of structures and design consi derations. 4. Codes and regulations; implementation. 5. Earthquake hazards and emergency planning. Upon completion of each section, general discussion and short presentations by several of the participants took place and summary statements were offered by the main lecturers. The atmosphere of the meetings was in- VI formal and cordial thus giving rise to many unorthodox and newly conceived ideas.

The increasing necessity to solve complex problems in Structural Dynamics and Earthquake Engineering requires the development of new ideas, innovative methods and numerical tools for providing accurate numerical solutions in affordable computing times. This book presents the latest scientific developments in Computational Dynamics, Stochastic Dynam

This fascinating new book examines the issues of earthquake geotechnical engineering in a comprehensive way. It summarizes the present knowledge on earthquake hazards and their causative mechanisms as well as a number of other relevant topics. Information obtained from earthquake damage investigation (such as ground motion, landslides, earth pressure, fault action, or liquefaction) as well as data from laboratory tests and field investigation is supplied, together with exercises/questions.

Earthquakes affecting urban areas can lead to catastrophic situations and hazard mitigation requires preparatory

measures at all levels. Structural assessment is the diagnosis of the seismic health of buildings. Assessment is the prelude to decisions about rehabilitation or even demolition. The scale of the problem in dense urban settings brings about a need for macro seismic appraisal procedures because large numbers of existing buildings do not conform to the increased requirements of new earthquake codes and specifications or have other deficiencies. It is the vulnerable buildings - liable to cause damage and loss of life - that need immediate attention and urgent appraisal in order to decide if structural rehabilitation and upgrading are feasible. Current economic, efficient and occupant-friendly rehabilitation techniques vary widely and include the application either of precast concrete panels or layers, strips and patches of fiber reinforced polymers (FRP) in strategic locations. The papers in this book, many by renowned authorities in earthquake engineering, chart new and vital directions of research and application in the assessment and rehabilitation of buildings in seismic regions. While several papers discuss the probabilistic prediction and quantification of structural damage, others present approaches related with the in-situ and occupant friendly upgrading of buildings and propose both economical and practical techniques to address the problem.

Seismic Vulnerability Assessment of Civil Engineering Structures at Multiple Scales: From Single Buildings to Large-Scale Assessment provides an integrated, multiscale platform for fundamental and applied studies on the seismic vulnerability assessment of civil engineering structures, including buildings with different materials and building typologies. The book shows how various outputs obtained from different scales and layers of assessment (from building scale to the urban area) can be used to outline and implement effective risk mitigation, response and recovery strategies. In addition, it highlights how significant advances in earthquake engineering research have been achieved with the rise of new technologies and techniques. The wide variety of construction and structural systems associated with the complex behavior of their materials significantly limits the application of current codes and building standards to the existing building stock, hence this book is a welcomed guide on new construction standards and practices. Provides the theoretical backgrounds on the most advanced seismic vulnerability assessment approaches at different scales and for most common building typologies Covers the most common building typologies and the materials they are made from, such as concrete, masonry, steel, timber and raw earth Presents practical guidelines on how the outputs coming from such approaches can be used to outline effective risk mitigation and emergency planning strategies

Uses state-of-the-art computer technology to formulate displacement method with matrix algebra. Facilitates analysis of structural dynamics and applications to earthquake engineering and UBC and IBC seismic building codes.

During the last decade, the state-of-the-art in Earthquake Engineering Design and Analysis has made significant steps towards a more rational analysis of structures. This book reviews the fundamentals of displacement based methods. Starting from engineering seismology and earthquake geotechnical engineering, it proceeds to focus on design, analysis and testing of structures with emphasis on buildings and bridges.

The Encyclopedia of Earthquake Engineering is designed to be the authoritative and comprehensive reference covering all major aspects of the science of earthquake engineering, specifically focusing on the interaction between earthquakes and infrastructure. The encyclopedia comprises approximately 300 contributions. Since earthquake engineering deals with the interaction between earthquake disturbances and the built infrastructure, the emphasis is on basic design processes important to both non-specialists and engineers so that readers become suitably well informed without needing to deal with the details of specialist understanding. The encyclopedia's content provides technically-inclined and informed readers about the ways in which earthquakes can affect our infrastructure and how engineers would go about designing against, mitigating and remediating these effects. The coverage ranges from buildings, foundations, underground construction, lifelines and bridges, roads, embankments and slopes. The encyclopedia also aims to provide cross-disciplinary and cross-domain information to domain-experts. This is the first single reference encyclopedia of this breadth and scope that brings together the science, engineering and technological aspects of earthquakes and structures.

Many important advances in designing earthquake-resistant structures have occurred over the last several years. Civil engineers need an authoritative source of information that reflects the issues that are unique to the field. Comprising chapters selected from the second edition of the best-selling Handbook of Structural Engineering, Earthquake Eng

After the March 11, 2011, earthquake in Japan, there is overwhelming interest in worst-case analysis, including the critical excitation method. Nowadays, seismic design of structures performed by any seismic code is based on resisting previous natural earthquakes. Critical Excitation Methods in Earthquake Engineering, 2e, develops a new framework for modeling design earthquake loads for inelastic structures. The 2e, includes three new chapters covering the critical excitation problem for multi-component input ground motions, and that for elastic-plastic structures in a more direct way are incorporated and discussed in more depth. Finally, the problem of earthquake resilience of super high-rise buildings is discussed from broader viewpoints. Solves problems of earthquake resilience of super high-rise buildings Three new chapters on critical excitation problem for multi-component input ground motions Includes numerical examples of one and two-story models

Modern scientific investigations of earthquakes began in the 1880s, and the International Association of Seismology was organized in 1901 to promote collaboration of scientists and engineers in studying earthquakes. The International Handbook of Earthquake and Engineering Seismology, under the auspices of the International Association of Seismology and Physics of the Earth's Interior (IASPEI), was prepared by leading experts under a distinguished international advisory board and team of editors. The content is organized into 56 chapters and includes over 430 figures, 24 of which are in color. This large-format, comprehensive reference summarizes well-established facts, reviews relevant theories, surveys useful methods and techniques, and documents and archives basic seismic data. It will be the authoritative reference for scientists and engineers and a quick and handy reference for seismolo-

gists. Also available is The International Handbook of Earthquake and Engineering Seismology, Part B. Two CD-ROMs containing additional material packaged with the text

This book offers a comprehensive introduction to the theory of structural dynamics, highlighting practical issues and illustrating applications with a large number of worked out examples. In the spirit of "learning by doing" it encourages readers to apply immediately these methods by means of the software provided, allowing them to become familiar with the broad field of structural dynamics in the process. The book is primarily focused on practical applications. Earthquake resistant design is presented in a holistic manner, discussing both the underlying geophysical concepts and the latest engineering design methods and illustrated by fully worked out examples based on the newest structural codes. The spectral characteristics of turbulent wind processes and the main analysis methods in the field of structural oscillations due to wind gusts and vortex shedding are also discussed and applications illustrated by realistic examples of slender chimney structures. The user-friendly software employed is downloadable and can be readily used by readers to tackle their own problems.

The majority of the cases of earthquake damage to buildings, bridges, and other retaining structures are influenced by soil and ground conditions. To address such phenomena, Soil Dynamics and Earthquake Engineering is the appropriate discipline. This textbook presents the fundamentals of Soil Dynamics, combined with the basic principles, theories and methods of Geotechnical Earthquake Engineering. It is designed for senior undergraduate and postgraduate students in Civil Engineering & Architec-

ture. The text will also be useful to young faculty members, practising engineers and consultants. Besides, teachers will find it a useful reference for preparation of lectures and for designing short courses in Soil Dynamics and Geotechnical Earthquake Engineering. The book first presents the theory of vibrations and dynamics of elastic system as well as the fundamentals of engineering seismology. With this background, the readers are introduced to the characteristics of Strong Ground Motion, and Deterministic and Probabilistic seismic hazard analysis. The risk analysis and the reliability process of geotechnical engineering are presented in detail. An in-depth study of dynamic soil properties and the methods of their determination provide the basics to tackle the dynamic soil–structure interaction problems. Practical problems of dynamics of beam–foundation systems, dynamics of retaining walls, dynamic earth pressure theory, wave propagation and liquefaction of soil are treated in detail with illustrative examples.

This multi-contributor book provides comprehensive coverage of earthquake engineering problems, an overview of traditional methods, and the scientific background on recent developments. It discusses computer methods on structural analysis and provides access to the recent design methodologies and serves as a reference for both professionals and res

The subject of earthquake engineering has been the focus of my teaching and research for many years. Thus, when Mario Paz, the editor of this handbook, asked me to write a Foreword, I was interested and honored by his request. Worldwide, people are beginning to understand the severity of the danger to present and future generations caused

by the destruction of the environment. Earthquakes pose a similar threat; thus, the proper use of methods for earthquake-resistant design and construction is vitally important for countries that are at high risk of being subjected to strong--motion earthquakes. Most seismic activity is the result of tectonic earthquakes. Tectonic earthquakes are very special events in that, although they occur frequently, their probability of becoming natural hazards for a specific urban area is very small. When a severe earthquake does occur near an urban area, however, its consequences are very large in terms of structural destruction and human suffering.

This book addresses current activities in strong-motion networks around the globe, covering issues related to designing, maintaining and disseminating information from these arrays. The book is divided into three principal sections. The first section includes recent developments in regional and global ground-motion predictive models. It presents discussions on the similarities and differences of ground motion estimations from these models and their application to design spectra as well as other novel procedures for predicting engineering parameters in seismic regions with sparse data. The second section introduces topics about the particular methodologies being implemented in the recently established global and regional strong-motion databanks in Europe to maintain and disseminate the archived accelerometric data. The final section describes major strong-motion arrays around the world and their historical developments. The last three chapters of this section introduce projects carried out within the context of arrays deployed for seismic risk studies in metropolitan areas. Audience: This timely book will be of particular in-

terest for researchers who use accelerometric data extensively to conduct studies in earthquake engineering and engineering seismology.

This book addresses applications of earthquake engineering for both offshore and land-based structures. It is self-contained as a reference work and covers a wide range of topics, including topics related to engineering seismology, geotechnical earthquake engineering, structural engineering, as well as special contents dedicated to design philosophy, determination of ground motions, shock waves, tsunamis, earthquake damage, seismic response of offshore and arctic structures, spatial varied ground motions, simplified and advanced seismic analysis methods, sudden subsidence of offshore platforms, tank liquid impacts during earthquakes, seismic resistance of non-structural elements, and various types of mitigation measures, etc. The target readership includes professionals in offshore and civil engineering, officials and regulators, as well as researchers and students in this field.

Fundamentals of Earthquake Engineering: From Source to Fragility, Second Edition combines aspects of engineering seismology, structural and geotechnical earthquake engineering to assemble the vital components required for a deep understanding of response of structures to earthquake ground motion, from the seismic source to the evaluation of actions and deformation required for design, and culminating with probabilistic fragility analysis that applies to individual as well as groups of buildings. Basic concepts for accounting for the effects of soil-structure interaction effects in seismic design and assessment are also provided in this second edition. The nature of earthquake risk assessment is inherently mul-

ti-disciplinary. Whereas this book addresses only structural safety assessment and design, the problem is cast in its appropriate context by relating structural damage states to societal consequences and expectations, through the fundamental response quantities of stiffness, strength and ductility. This new edition includes material on the nature of earthquake sources and mechanisms, various methods for the characterization of earthquake input motion, effects of soil-structure interaction, damage observed in reconnaissance missions, modeling of structures for the purposes of response simulation, definition of performance limit states, fragility relationships derivation, features and effects of underlying soil, structural and architectural systems for optimal seismic response, and action and deformation quantities suitable for design. Key features: Unified and novel approach: from source to fragility Clear conceptual framework for structural response analysis, earthquake input characterization, modelling of soil-structure interaction and derivation of fragility functions Theory and relevant practical applications are merged within each chapter Contains a new chapter on the derivation of fragility Accompanied by a website containing illustrative slides, problems with solutions and worked-through examples Fundamentals of Earthquake Engineering: From Source

to Fragility, Second Edition is designed to support graduate teaching and learning, introduce practising structural and geotechnical engineers to earthquake analysis and design problems, as well as being a reference book for further studies.

This book provides senior undergraduate students, master students and structural engineers who do not have a background in the field with core knowledge of structural earthquake engineering that will be invaluable in their professional lives. The basics of seismotectonics, including the causes, magnitude, and intensity of earthquakes, are first explained. Then the book introduces basic elements of seismic hazard analysis and presents the concept of a seismic hazard map for use in seismic design. Subsequent chapters cover key aspects of the response analysis of simple systems and building structures to earthquake ground motions, design spectrum, the adoption of seismic analysis procedures in seismic design codes, seismic design principles and seismic design of reinforced concrete structures. Helpful worked examples on seismic analysis of linear, nonlinear and base isolated buildings, earthquake-resistant design of frame and frame-shear wall systems are included, most of which can be solved using a hand calculator.