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KEY=EARTHQUAKE - JIMENA URIEL

BASIC EARTHQUAKE ENGINEERING

FROM SEISMOLOGY TO ANALYSIS AND DESIGN

Springer 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.

FUNDAMENTALS OF EARTHQUAKE ENGINEERING

FROM SOURCE TO FRAGILITY

John Wiley & Sons Updated and expanded edition including new chapters on the cutting edge research areas of soil structure interaction (SSI) and fragility formulations **Earthquake Engineering: From Source to Fragility, 2nd 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. Basic concepts for accounting for the effects of soil-structure interaction effects in seismic design and assessment are covered in detail. Also included is 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 curve derivations, structural and architectural systems for optimal seismic response, and action and deformation quantities suitable for design. **Earthquake Engineering: From Source to Fragility, 2nd Edition** has been updated to include two new chapters. The first on soil structure interaction (SSI) illustrates the factors affecting the SSI and the effects of SSI on ground motion and comprehensively discusses the existing models for soil and foundation systems. The second new chapter deals with fragility formulations, a topic which is at the cutting-edge of modern seismic risk assessment. This book is accompanied by a website containing a comprehensive set of slides illustrating the chapters and appendices, as well as a set of problems with solutions and worked-through examples. Updated and expanded edition including new chapters on the cutting edge research areas of soil structure interaction (SSI) and fragility formulations Combines aspects of engineering seismology, structural and geotechnical earthquake engineering to provide an understanding of the response of structures to earthquake ground motion Each chapter is written within the framework from source (of earthquakes) to societal consequences Accompanied by a website hosting slides, problem sets with solutions and worked-through examples A reference for practising structural engineers and architects, building code developers. Graduate students in earthquake, geotechnical and structural engineering departments.

BASIC EARTHQUAKE ENGINEERING

Earthquake engineering or seismic engineering is the scientific field concerned with protecting society, the natural environment, and the man-made environment from earthquakes by limiting the seismic risk to socio-economically acceptable levels. Earthquake Engineering can be defined as the branch of engineering devoted to mitigating earthquake hazards. In this broad sense, earthquake engineering covers the investigation and solution of the problems created by damaging earthquakes, and consequently the work involved in the practical application of these solutions, i.e. in planning, designing, constructing and managing earthquake-resistant structures and facilities. The main objectives of earthquake engineering are to predict the potential consequences of strong earthquakes on urban areas and civil infrastructure. A properly engineered structure does not necessarily have to be extremely strong or expensive. It has to be properly designed to withstand the seismic effects

while sustaining an acceptable level of damage. This book emphasizes to students of structural and architectural engineering the problems and solutions in attaining efficient earthquake-resistant structures and facilities. To achieve this objective, after a brief discussion of the general goals in seismic-resistant design and construction of structures and facilities, the diverse sources of damage that can be triggered by an earthquake are discussed.

FUNDAMENTAL CONCEPTS OF EARTHQUAKE ENGINEERING

CRC Press 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 current!

BASIC EARTHQUAKE ENGINEERING FOR STRUCTURAL ENGINEERS

DIAGRAMS AND REFERENCES USED IN A SERIES OF THREE VIDEOTAPES

INTRODUCTION TO EARTHQUAKE ENGINEERING

CRC Press This book is intended primarily as a textbook for students studying structural engineering. It covers three main areas in the analysis and design of structural systems subjected to seismic loading: basic seismology, basic structural dynamics, and code-based calculations used to determine seismic loads from an equivalent static method and a dynamics-based method. It provides students with the skills to determine seismic effects on structural systems, and is unique in that it combines the fundamentals of structural dynamics with the latest code specifications. Each chapter contains electronic resources: image galleries, PowerPoint presentations, a solutions manual, etc.

GEOTECHNICAL EARTHQUAKE ENGINEERING, SECOND EDITION

McGraw Hill Professional 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.

ELEMENTS OF EARTHQUAKE ENGINEERING AND STRUCTURAL DYNAMICS

Presses inter Polytechnique "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.

STRUCTURAL DYNAMICS OF EARTHQUAKE ENGINEERING

THEORY AND APPLICATION USING MATHEMATICA AND MATLAB

Elsevier Given the risk of earthquakes in many countries, knowing how structural dynamics can be applied to earthquake engineering of structures, both in theory and practice, is a vital aspect of improving the safety of buildings and structures. 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-degree-of-freedom (SDOF) systems, both damped and undamped, and forced vibration (harmonic force) of SDOF systems. Response to periodic dynamic loadings and impulse loads are also discussed, as are two degrees of freedom linear system response methods and free vibration of multiple degrees of freedom. Further chapters cover time history response by natural mode superposition, numerical solution methods for natural frequencies and mode shapes and differential quadrature, transformation and Finite Element methods for vibration problems. Other topics such as earthquake ground motion, response spectra and earthquake analysis of linear systems are discussed. *Structural dynamics of earthquake engineering: theory and application using Mathematica and Matlab* provides civil and structural engineers and students with an understanding of the dynamic response of structures to earthquakes and the common analysis techniques employed to evaluate these responses. Worked examples in Mathematica and Matlab are given. Explains the dynamic response of structures to earthquakes including periodic dynamic loadings and impulse loads Examines common analysis techniques such as natural mode superposition, the finite element method and numerical solutions Investigates this important topic in terms of both theory and practise with the inclusion of practical exercise and diagrams

BASIC STRUCTURAL DYNAMICS

John Wiley & Sons A concise introduction to structural dynamics and earthquake engineering *Basic Structural Dynamics* serves as a fundamental introduction to the topic of structural dynamics. Covering single and multiple-degree-of-freedom systems while providing an introduction to earthquake engineering, the book keeps the coverage succinct and on topic at a level that is appropriate for undergraduate and graduate students. Through dozens of worked examples based on actual

structures, it also introduces readers to MATLAB, a powerful software for solving both simple and complex structural dynamics problems. Conceptually composed of three parts, the book begins with the basic concepts and dynamic response of single-degree-of-freedom systems to various excitations. Next, it covers the linear and nonlinear response of multiple-degree-of-freedom systems to various excitations. Finally, it deals with linear and nonlinear response of structures subjected to earthquake ground motions and structural dynamics-related code provisions for assessing seismic response of structures. Chapter coverage includes: Single-degree-of-freedom systems Free vibration response of SDOF systems Response to harmonic loading Response to impulse loads Response to arbitrary dynamic loading Multiple-degree-of-freedom systems Introduction to nonlinear response of structures Seismic response of structures If you're an undergraduate or graduate student or a practicing structural or mechanical engineer who requires some background on structural dynamics and the effects of earthquakes on structures, *Basic Structural Dynamics* will quickly get you up to speed on the subject without sacrificing important information.

INTRODUCTION TO DYNAMICS OF STRUCTURES AND EARTHQUAKE ENGINEERING

Springer 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 contains 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.

EARTHQUAKE ENGINEERING

CRC Press 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.

FUNDAMENTALS OF EARTHQUAKE ENGINEERING

John Wiley & Sons Incorporated **Fundamentals of Earthquake Engineering** 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. The nature of earthquake risk assessment is inherently multi-disciplinary. Whereas **Fundamentals of Earthquake Engineering** 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. The book is designed to support graduate teaching and learning, introduce practicing structural and geotechnical engineers to earthquake analysis and design problems, as well as being a reference book for further studies. **Fundamentals of Earthquake Engineering** includes material on the nature of earthquake sources and mechanisms, various methods for the characterization of earthquake input motion, damage observed in reconnaissance missions, modeling of structures for the purposes of response simulation, definition of performance limit states, structural and architectural systems for optimal seismic response, and action and deformation quantities suitable for design. The accompanying website at www.wiley.com/go/elnashai contains a comprehensive set of slides illustrating the chapters and appendices. A set of problems with solutions and worked-through examples is available from the Wley Editorial team. The book, slides and problem set constitute a tried and tested system for a single-semester graduate course. The approach taken avoids tying the book to a specific regional seismic design code of practice and ensures its global appeal to graduate students and practicing engineers.

FUNDAMENTALS OF SEISMIC LOADING ON STRUCTURES

John Wiley & Sons 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 linear and non-linear behaviour, introduces concepts

of uniform hazard spectra, discusses loading provisions in design codes and examines soil-structure interaction issues, allowing the reader to quickly identify and implement information in a working environment. Discusses probabilistic methods that are widely employed in the assessment of seismic hazard, illustrating the use of Monte Carlo simulation with a number of worked examples. Summarises the latest developments in the field such as performance-based seismic engineering and advances in liquefaction research. "There are many books on earthquake engineering, but few are of direct use to the practising structural designer. This one, however, offers a new perspective, putting emphasis on the practical aspects of quantifying seismic loading, and explaining the importance of geotechnical effects during a major seismic event in readily understandable terms. The author has succeeded in marrying important seismological considerations with structural engineering practice, and this long-awaited book will find ready acceptance in the profession." Professor Patrick J. Dowling CBE, DL, DSc, FStructE, Hon MRIA, FIAE, FEng, FRS Chairman, British Association for the Advancement of Science Emeritus Professor and Retired Vice Chancellor, University of Surrey

EARTHQUAKE ENGINEERING FOR STRUCTURAL DESIGN

CRC Press **Developments in Earthquake Engineering** have focused 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.

INTERNATIONAL HANDBOOK OF EARTHQUAKE ENGINEERING

CODES, PROGRAMS, AND EXAMPLES

Springer Science & Business Media **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.

BASIC CONCEPTS OF SEISMIC CODES

MODERN EARTHQUAKE ENGINEERING

OFFSHORE AND LAND-BASED STRUCTURES

Springer 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.

EARTHQUAKE ENGINEERING

APPLICATION TO DESIGN

Wiley Learn to design code-compliant, earthquake-resistant structures with this practical guide *Earthquake Engineering* demonstrates how to design structural members and joints for seismic resistance. The text guides readers through dozens of structural designs, documenting how to perform each step, make the necessary calculations, and adhere to relevant design codes. Most other texts on seismic design focus on theory and the construction of idealized structures; this text is a radical departure, presenting actual tested design methodologies that protect structures from the devastation of earthquakes. All the design methods presented by the author comply with the current U.S. building codes. References to these codes are provided throughout the text, helping readers understand how they are integrated into an overall structural design. Everything readers need to create sound designs, from analysis to design implementation, is provided, including: * Dozens of worked problems

throughout the text * Complete reference chapters dedicated to matrices, differential equations, and numerical analysis * Latest results of ongoing seismic research, including how these studies are likely to influence future design projects * The latest 2006 IBC, highlighting significant variations from the 2000 and 2003 editions of the code * Detailed coverage of seismic design for steel moment-resisting frame structures (SMRF), as well as braced-frame steel, concrete, masonry, and wood-framed structures This text, with its many worked problems, is ideal for upper-level undergraduates and graduate students. Now that the seismic engineering provisions of the IBC Code apply to the entire United States, this text should also guide practicing engineers not yet exposed to seismic design in designing code-compliant, earthquake-resistant structures.

SEISMIC DESIGN OF BUILDINGS TO EUROCODE 8

CRC Press This book focuses on the seismic design of building structures and their foundations to Eurocode 8. It covers the principles of seismic design in a clear but brief manner and then links these concepts to the provisions of Eurocode 8. It addresses the fundamental concepts related to seismic hazard, ground motion models, basic dynamics, seismic analysis, siting considerations, structural layout, and design philosophies, then leads to the specifics of Eurocode 8. Code procedures are applied with the aid of walk-through design examples which, where possible, deal with a common case study in most chapters. As well as an update throughout, this second edition incorporates three new and topical chapters dedicated to specific seismic design aspects of timber buildings and masonry structures, as well as base-isolation and supplemental damping. There is renewed interest in the use of sustainable timber buildings, and masonry structures still represent a popular choice in many areas. Moreover, seismic isolation and supplemental damping can offer low-damage solutions which are being increasingly considered in practice. The book stems primarily from practical short courses on seismic design which have been run over a number of years and through the development Eurocode 8. The contributors to this book are either specialist academics with significant consulting experience in seismic design, or leading practitioners who are actively engaged in large projects in seismic areas. This experience has provided significant insight into important areas in which guidance is required.

EARTHQUAKE ENGINEERING

Structural Engineering: Mechanics and Design 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.

INTERNATIONAL HANDBOOK OF EARTHQUAKE & ENGINEERING SEISMOLOGY

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

BASIC ELEMENTS OF EARTHQUAKE ENGINEERING

Wiley Traditionally, books on earthquake engineering have treated only one or more aspects of the subject or have been compendiums with contributions from several authors. Basic Elements of Earthquake Engineering is the first comprehensive examination of earthquake engineering, lending balance and coherence to a subject too often approached in pieces. Based on sound theoretical concepts and practical design considerations, the book covers the analysis and design of structures, systems, and components that can resist earthquake ground motions. Presenting a rational progression of topics, the book discusses seismic hazard assessment, definition of design ground motion, response analysis including foundation interaction, inelastic response, ductile design and response, and qualification of supported systems.

ADVANCES IN EARTHQUAKE ENGINEERING FOR URBAN RISK REDUCTION

Springer Science & Business Media 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.

GEOTECHNICAL EARTHQUAKE ENGINEERING

Pearson Education India This is the first book on the market focusing specifically on the topic of geotechnical earthquake engineering. The book draws from the fields of seismology and structural engineering to present a broad, interdisciplinary view of the fundamental concepts in seismology, geotechnical engineering, and structural engineering.

EARTHQUAKE RESISTANT ENGINEERING STRUCTURES XI

WIT Press In its 11th year, and reporting on the latest research on preparation for and mitigation of future earthquakes, this volume examines an area of increasing importance to many countries around the world. ERES 2017 assembled experts from around the world to present their basic and applied research in the fields of earthquake engineering relevant to the design of structures. As the world's population has concentrated in urban areas resulting in buildings in regions of high seismic vulnerability, we have seen the consequences of natural disasters take an ever higher toll on human existence. Protecting the built environment in earthquake-prone regions involves not only the optimal design and construction of new facilities, but also the upgrading and rehabilitation of existing structures including heritage buildings, which is an important area of research. Major earthquakes and associated effects, such as tsunamis, continue to stress the need to carry out more research and a better understanding of these phenomena is required to design earthquake resistant buildings and to carry out risk assessment and vulnerability studies. Some of the subject areas covered are: Seismic isolation and energy dissipation; Building performance during earthquakes; Numerical analysis; Performance based design; Experimental studies; Seismic hazards and tsunamis; Safety engineering; Liquefaction; Innovative technologies; Paraseismic devices and Lifelines and resilience.

CRITICAL EXCITATION METHODS IN EARTHQUAKE ENGINEERING

Butterworth-Heinemann 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

EARTHQUAKE ENGINEERING

FROM ENGINEERING SEISMOLOGY TO PERFORMANCE-BASED ENGINEERING

CRC Press 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

COMPUTATIONAL METHODS IN EARTHQUAKE ENGINEERING

VOLUME 2

Springer Science & Business Media 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 ENGINEERING

MECHANISM, DAMAGE ASSESSMENT AND STRUCTURAL DESIGN

World Scientific This book is the expanded version of the earlier (first edition) text. It presents new comprehensive rational quantitative theories (utilizing fundamental energy concepts throughout) covering the entire earthquake event from the point of view of the engineer. It starts with a mathematical analysis of an underground mechanism (the earthquake), then proceeds to determinations of the timewise and spacewise variations of the fundamental engineering damage-design parameter, the ground energy. Finally, the new theories are applied to a number of typical (actual) structural and non-structural design problems. Each chapter of the first edition has now been improved and enlarged and new chapters have been added to include recent research by the author and his graduate students.

EARTHQUAKE ENGINEERING OF TIMBER STRUCTURES

MODELLING AND SIMULATION OF COLLAPSE

CRC Press In recent decades several major earthquakes have caused serious damage to wooden houses, highlighting the need for earthquake-proofing of timber structures. Existing design concepts are mainly based on the static considerations of shear-resistant walls or frames of timber structures, and thus cannot predict the behavior of severely damaged structures. Meanwhile, timber structure research has employed response analyses, large-scale tests and shaking tables, which have considerable increased understanding of the behavior of wooden houses during earthquakes. Applying this knowledge and new analytical tools based on the discrete elements method, the Japanese Building Research Institute has developed the Wallstat collapse analysis software for damage assessment and prediction of the likelihood of whole building collapse during seismic motion. Researchers and engineers who specialize in timber structures can now more readily generate their own research results. This book outlines the seismic behaviour and seismic performance requirement of timber structures and explains the concept of basic earthquake-proof design, and it provides background to the collapse analysis of timber structures by seismic loading, and explains the Wallstat software along with several worked examples. The "Wallstat" executable program and its brief manual, in English, can be downloaded at www.crcpress.com/product/isbn/9781482206319

ADVANCED EARTHQUAKE ENGINEERING ANALYSIS

Springer Science & Business Media 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.

EARTHQUAKE ENGINEERING FOR STRUCTURAL DESIGN

CRC Press 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

EARTHQUAKE ENGINEERING HANDBOOK

CRC Press 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

EARTHQUAKE DESIGN PRACTICE FOR BUILDINGS

ICE Publishing Earthquake Design Practice for Buildings, 3rd edition provides comprehensive, practical and easy to read advice for all engineers, designers and analysts of earthquake resistant structures. This new edition has been completely revised to account for the many developments that had taken place since the publication of the bestselling second edition.

FUNDAMENTALS OF SOIL DYNAMICS AND EARTHQUAKE ENGINEERING

PHI Learning Pvt. Ltd. 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 & Architecture. 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.

EARTHQUAKE ENGINEERING HANDBOOK

CRC Press 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

STRUCTURAL DYNAMICS WITH APPLICATIONS IN EARTHQUAKE AND WIND ENGINEERING

Springer 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.

PERFORMANCE-BASED SEISMIC ENGINEERING: VISION FOR AN EARTHQUAKE RESILIENT SOCIETY

Springer The Bled workshops have traditionally produced reference documents providing visions for the future development of earthquake engineering as foreseen by leading researchers in the field. The participants of the 2011 workshop built on the tradition of these events initiated by Professors Fajfar and Krawinkler to honor their important research contributions and have now produced a book providing answers to crucial questions in today's earthquake engineering: "What visible changes in the design practice have been brought about by performance-based seismic engineering? What are the critical needs for future advances? What actions should be taken to respond to those needs?" The

key answer is that research interests should go beyond the narrow technical aspects and that the seismic resilience of society as a whole should become an essential part of the planning and design process. The book aims to provide essential guidelines for researchers, professionals and students in the field of earthquake engineering. It will also be of particular interest for all those working at insurance companies, governmental, civil protection and emergency management agencies that are responsible for assessing and planning community resilience. The introductory chapter of the book is based on the keynote presentation given at the workshop by the late Professor Helmut Krawinkler. As such, the book includes Helmut's last and priceless address to the engineering community, together with his vision and advice for the future development of performance-based design, earthquake engineering and seismic risk management.

RECENT ADVANCES IN EARTHQUAKE ENGINEERING IN EUROPE

16TH EUROPEAN CONFERENCE ON EARTHQUAKE ENGINEERING- THESSALONIKI 2018

Springer This book is a collection of invited lectures including the 5th Nicholas Ambraseys distinguished lecture, four keynote lectures and twenty-two thematic lectures presented at the 16th European Conference on Earthquake Engineering, held in Thessaloniki, Greece, in June 2018. The lectures are put into chapters written by the most prominent internationally recognized academics, scientists, engineers and researchers in Europe. They address a comprehensive collection of state-of-the-art and cutting-edge topics in earthquake engineering, engineering seismology and seismic risk assessment and management. The book is of interest to civil engineers, engineering seismologists, seismic risk managers, policymakers and consulting companies covering a wide spectrum of fields from geotechnical and structural earthquake engineering, to engineering seismology and seismic risk assessment and management. Scientists, professional engineers, researchers, civil protection policymakers and students interested in the seismic design of civil engineering structures and infrastructures, hazard and risk assessment, seismic mitigation policies and strategies, will find in this book not only the most recent advances in the state-of-the-art, but also new ideas on future earthquake engineering and resilient design of structures. Chapter 1 of this book is available open access under a CC BY 4.0 license.