Carpinteri And Alberto Structural Mechanics

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.

The book explores the two opposite natural trends of composite systems: (i) order and structure emerging from heterogeneity and randomness, and (ii) instability and chaos arising from simple nonlinear

rules. Providing insights into the rapidly growing field of complexity sciences, the book focuses on the role of complexity in fracture mechanics. It firstly discusses the occurrence of self-similarity and fractal patterns in deformation, damage, fracture, and

fragmentation of heterogeneous materials and the apparent scaling of the nominal mechanical properties of disordered materials, as well as of the time-to-failure after fatigue and creep loading. Then the book addresses criticality in the acoustic emissions from damaged

structures and tectonic faults. Further, it examines the snap-back instability in the structural behavior of relatively large composite structures in the framework of catastrophe theory, and lastly describes the transition toward chaos in the dynamics of cracked

elements.

In the Wake of Tacoma is the first comprehensive treatment of the changes that the 1940 collapse of the first Tacoma Narrows Bridge has imposed on the design of suspension bridges. Written as a historical narrative, this heavily

illustrated book describes design trends before the collapse, the collapse itself, and the investigations to determine its cause. The book then examines subsequent aerodynamic and other design developments and their application in suspension bridges

worldwide in the decades following the collapse. In the Wake of Tacoma is a comprehensive reference work on suspension bridges in general, examining virtually every suspension bridge of note built in the past sixty years and highlighting overall development of

the state of the art today. It goes beyond the major, well-known bridges to examine many small and mid-span suspension bridges worldwide that have contributed significantly to the modern development of the form. Also covered are the engineering

debates and engineers involved; discussions of bridges under construction and under design; and new design concepts and materials to conquer the huge distances envisaged for such crossings as the Messina and Gibraltar straits. Presented in easy-to-understand,

nontechnical language, this book, which received the 2006 Publication Award from the Japan Association for Wind Engineering, should appeal to both engineers and nonengineers with an interest in bridges and engineering in general. About the Author Richard Scott is a

waterway heritage planner for Parks Canada, where he is currently responsible for palnning along the Trent-Severn waterway. He is also the editor of History of the Modern Suspension Bridge: Solving the Dilemma between Economy and Stiffness (ASCE Press, 2010).

Product Reviews ...An outstanding history of suspension bridges focusing on post-Tacoma spans... In the Wake of Tacoma is extremely visual and written in a style that makes it accessible, exciting and interesting to both engineers and the general public. It is a masterful

study- well researched, written, and illustrated. --Eric DeLony, Chief, Historic American Engineering Record, National Park Service

This conference is the first in a series of conferences dedicated to Fracture Mechanics of Concrete Structures. Due to the recent

explosion of interest in research on fracture in concrete, the conference has brought together the world's leading researchers in fracture of concrete and this book contains the proceedings.

Proceedings of XXIV AIMETA Conference 2019

Principles of Structure, Fifth Edition

Composition and properties of concrete

Device Physics, Processing, Degradation, and Prevention

Elasticity in Engineering Mechanics

Elasticity in Engineering Mechanics has been prized by many aspiring and

practicing engineers as an easy-to-navigate guide to an area of engineering science that is fundamental to aeronautical, civil, and mechanical engineering, and to other branches of engineering. With its focus not only on elasticity theory, including nano- and biomechanics, but also on concrete

applications in real engineering situations, this acclaimed work is a core text in a spectrum of courses at both the undergraduate and graduate levels, and a superior reference for engineering professionals.

Over forty years of teaching experience are distilled into this text. The guiding

principle is the wide use of the concept of intermediate asymptotics, which enables the natural introduction of the modeling of real bodies by continua. Beginning with a detailed explanation of the continuum approximation for the mathematical modeling of the motion and equilibrium of real bodies, the

author continues with a general survey of the necessary methods and tools for analyzing models. Next, specific idealized approximations are presented, including ideal incompressible fluids, elastic bodies and Newtonian viscous fluids. The author not only presents general concepts but also devotes chapters to examining

significant problems, including turbulence, wave-propagation, defects and cracks, fatigue and fracture. Each of these applications reveals essential information about the particular approximation. The author's tried and tested approach reveals insights that will be valued by every teacher and student of

mechanics.

Building on the author's Structural Mechanics Fundamentals, this text presents a complete and uniform treatment of the more advanced topics in structural mechanics, ranging from beam frames to shell structures, from dynamics to buckling analysis, from plasticity to

fracture mechanics, from long-span to high-rise civil structures. Plane frames Statically indeterminate beam systems: Method of displacements Plates and shells Finite element method Dynamics of discrete systems Dynamics of continuous elastic systems Buckling instability Long-span structures High-

rise structures Theory of plasticity Plane stress and plane strain conditions Mechanics of fracture This book serves as a text for graduate students in structural engineering, as well as a reference for practising engineers and researchers.

This second edition of Structural

Mechanics is an expanded and revised successor to the highly successful first edition, which over the last ten years has become a widely adopted standard first year text. The addition of five new programmes, together with some updating of the original text, now means that this book covers most of the

principles of structural mechanics taught in the first and second years of civil engineering degree courses. - Suitable for independent study or as a compliment to a traditional lecture-based course - Adopts a programmed learning format, with a focus on student-centred learning - Contains many examples, carefully

constructed questions and graded practical problems, allowing the reader to work at their own pace, and assess their progress whilst gaining confidence in their ability to apply the principles of Structural Mechanics - Now covering the major part of the Structural Mechanics/Analysis syllabuses of most

Civil Engineering degree courses up to second year level.

Scaling

Proceedings of the First International Conference on Fracture Mechanics of Concrete Structures (FraMCoS1), held at Beaver Run Resort, Breckenridge, Colorado, USA, 1-5 June 1992.

Flow, Deformation and Fracture

Organic Solar Cells

Non-Linear Mechanics of Reinforced Concrete

This volume emphazises the most recent advances in fracture mechanics as specifically applied to steel bar reinforced concrete.

Fracture mechanics has been applied to plain and fibre reinforced concrete with increasing success over recent years. This workshop extended these concepts to steel bar reinforced and pre-stressed concrete design. Particularly for high strength concrete, which is a

very brittle material, and in the case of large structural members, the application of fracture mechanics appears to be very useful for improving the present design rules. The pre-eminent participants at the Turin workshop contributed extensive expert opinions in four

selected areas for which a rational approach, using fracture mechanics, could introduce variations into the concrete design codes: size effects; anchorage and bond; minimum reinforcement for elements in flexure; and shear resistance. The 23 chapters

logically address these themes and demonstrate the unique ability of fracture mechanics to capture all the experimentally observed characteristics. The book is primarily directed to the researchers in universities and institutions and will be of value to

consultants and engineering companies.
What is involved in restoring a river? River Quality: Dynamics and Restoration answers this question through a series of articles and case studies written by some of the field's leading researchers and

practitioners. The first part of the book covers the physical, chemical, and biological dynamics of a river system. The second part describes monitoring programs and remedial measures used to restore river systems back to healthy and functional states. The Willamette

River in Oregon and the Vistula River in Poland are used to illustrate the dynamic and restoration processes. Each river is in a different stage of restoration and is subjected to different degrees of stress from agriculture, industry, and urbanization. The

Willamette is an internationally cited example of a restored river, while the Vistula is a river that has just recently begun the restoration process. Contrasts and comparisons of the two river systems enable readers to learn the limitations of restoration processes

and what is involved in the different stages of restoration.
The book is characterized by the illustration of cases of fractal, self-similar and multi-scale structures taken from the mechanics of solid and porous materials, which have a technical interest. In addition, an

accessible and self-consistent treatment of the mathematical technique of fractional calculus is provided, avoiding useless complications.

This book reviews the fundamental causes and spectrum effects of ASR. It considers he advances that

have been made in our understanding of this problem throughout the world.
River Quality
A unified approach
A New Perspective in Fracture Mechanics
One Century since Griffith’s

Milestone
Structural Mechanics
Structural Mechanics Fundamentals gives you a complete and uniform treatment of the most fundamental and essential topics in structural

mechanics. Presenting a traditional subject in an updated and modernized way, it merges classical topics with ones that have taken shape in more recent times, such as duality. This book is extensively based on the

introductory chapters to the author's Structural Mechanics: A Unified Approach. Coverage includes: The basic topics of geometry of areas and of kinematics and statics of rigid body systems The mechanics of

linear elastic solids—beams, plates, and three-dimensional solids—examined using a matrix approach The analysis of strain and stress around a material point The linear elastic constitutive law, with

related Clapeyron's and Betti's theorems Kinematic, static, and constitutive equations The implication of the principle of virtual work The Saint Venant problem The theory of beam systems—statically

determinate or indeterminate Methods of forces and energy for the examination of indeterminate beam systems The book draws on the author's many years of teaching experience and features a wealth of

illustrations and worked examples to help explain the topics clearly yet rigorously. The book can be used as a text for senior undergraduate or graduate students in structural engineering or architecture

and as a valuable reference for researchers and practicing engineers. div="" style=""This fourth edition focuses on the basics and advanced topics in strength of materials. This is an essential guide

to students, as several chapters have been rewritten and their scope has expanded. Four new chapters highlighting combined loadings, unsymmetrical bending and shear centre, fixed beams, and rotating

rings, discs and cylinders have been added. New solved examples, multiple choice questions and short answer questions have been added to augment learning. The entire text has been thoroughly revised and updated to

eliminate the possible errors left out in the previous editions of the book. This textbook is ideal for the students of Mechanical and Civil Engineering. ^

BIM for Structural

Engineering and Architecture Building Information Modeling: Framework for Structural Design outlines one of the most promising new developments in architecture, engineering, and construction (AEC).

Building information modeling (BIM) is an information management and analysis technology that is changing the role of computation in the architectural and engineering industries. The

innovative process constructs a database assembling all of the objects needed to build a specific structure. Instead of using a computer to produce a series of drawings that together describe the

building, BIM creates a single illustration representing the building as a whole. This book highlights the BIM technology and explains how it is redefining the structural analysis and

design of building structures. BIM as a Framework Enabler This book introduces a new framework—the structure and architecture synergy framework (SAS framework)—that helps

develop and enhance the understanding of the fundamental principles of architectural analysis using BIM tools. Based upon three main components: the structural melody, structural poetry, and

structural analysis, along with the BIM tools as the frame enabler, this new framework allows users to explore structural design as an art while also factoring in the principles of engineering. The framework

stresses the influence structure can play in form generation and in defining spatial order and composition. By highlighting the interplay between architecture and structure, the book emphasizes the

conceptual behaviors of structural systems and their aesthetic implications and enables readers to thoroughly understand the art and science of whole structural system concepts. Presents the use of BIM

technology as part of a design process or framework that can lead to a more comprehensive, intelligent, and integrated building design Places special emphasis on the application of BIM technology for

exploring the intimate relationship between structural engineering and architectural design Includes a discussion of current and emerging trends in structural engineering practice and the role of the

structural engineer in building design using new BIM technologies Building Information Modeling: Framework for Structural Design provides a thorough understanding of architectural structures and

introduces a new framework that revolutionizes the way building structures are designed and constructed. Critical distance methods are extremely useful for predicting fracture and fatigue in engineering

components. They also represent an important development in the theory of fracture mechanics. Despite being in use for over fifty years in some fields, there has never been a book about these methods – until now.

So why now? Because the increasing use of computer-aided stress analysis (by FEA and other techniques) has made these methods extremely easy to use in practical situations. This is turn has prompted

researchers to re-examine the underlying theory with renewed interest. The Theory of Critical Distances begins with a general introduction to the phenomena of mechanical failure in materials: a basic

understanding of solid mechanics and materials engineering is assumed, though appropriate introductory references are provided where necessary. After a simple explanation of how to use critical

distance methods, and a more detailed exposition of the methods including their history and classification, the book continues by showing examples of how critical distance approaches can be applied to predict

fracture and fatigue in different classes of materials. Subsequent chapters include some more complex theoretical areas, such as multiaxial loading and contact problems, and a range of practical examples

using case studies of real engineering components taken from the author's own consultancy work. The Theory of Critical Distances will be of interest to a range of readers, from academic researchers concerned with

the theoretical basis of the subject, to industrial engineers who wish to incorporate the method into modern computer-aided design and analysis. Comprehensive collection of published data, plus new data from the

author's own laboratories A simple 'how-to-do-it' exposition of the method, plus examples and case studies Detailed theoretical treatment Covers all classes of materials: metals, polymers, ceramics and

composites Includes fracture, fatigue, fretting, size effects and multiaxial loading

THz Vibrations and Modal Analysis in Proteins and Macromolecular Structures Applications to the

Automotive, Marine, Aerospace and Construction Industry

Environment-Friendly Techniques of Rock Breaking

Waves in Biomechanics

Fracture and Complexity

This book describes the

application of nonlinear static and dynamic analysis for the design, maintenance and seismic strengthening of reinforced concrete structures. The latest

structural and RC constitutive modelling techniques are described in detail, with particular attention given to multi-dimensional cracking and

damage assessment, and their practical applications for performance-based design. Other subjects covered include 2D/3D analysis techniques,

bond and tension stiffness, shear transfer, compression and confinement. It can be used in conjunction with WCOMD and COM3 software Nonlinear

Mechanics of Reinforced Concrete presents a practical methodology for structural engineers, graduate students and researchers concerned with the

design and maintenance of concrete structures. Since its first publication in 1974, Principles of Structure has established itself at the forefront of

introductory texts for students of architecture, building and project management seeking a basic understanding of the behavior and design of

building structures. It provides a simple quantitative introduction to structural engineering, while also drawing connections to real

buildings that are more complex. Retaining the style and format of earlier editions, this Fifth Edition brings the text and examples into alignment with

international practice. It also features six new buildings from around the world, illustrating the principles described in the text. The book begins with a chapter

explaining forces and their effects. Other chapters cover ties and struts, loadings, graphical statics, bracings, shears and moments, stresses,

deflections, and beam design. There is also an appendix with a fuller explanation of fundamentals for readers unfamiliar with the basic concepts of

geometry and statics. The book offers a unique format with right-hand pages containing text and left-hand pages containing complementary commentary including

explanations and expansions of points made in the text and worked examples. This cross-referencing gives readers a range of perspectives and a

deeper understanding of each topic. The simple mathematical approach and logical progression—along with the hints and suggestions, worked

examples and problem sheets—give beginners straightforward access to elementary structural engineering.
Condensed Isogeometric Analysis for Plates and

Shell Structures proposes a novel technique for plate and shell governing equations based on isogeometric analysis, which condenses the

dynamic equilibrium equation for plate and shell structures—suitable for reducing the computation cost of large degrees of freedom due to the

adoption of Non-Uniform Rational Basis Spline (NURBS) models in the plate and shell element formulations. It features useful guidance for understanding the

isogeometric approach and includes accompanying MATLAB® source code in each chapter to deepen readers' understanding of the fundamental

theories and methods of civil, architectural, and mechanical engineering. Features: Adopts a progressive and rigorous presentation of relevant topics to

facilitate use by students, academics, and professionals Seamlessly integrates the CAD geometrical data into the conventional FE plate and shell

classical element codes Allows computation of analytical solutions of plate and shell theories based on a newly-introduced condensation method, not

approximation theory
Includes relevant MATLAB® codes
The author describes and teaches the art of discovering scaling laws, starting from

dimensional analysis and physical similarity, which are here given a modern treatment. He demonstrates the concepts of intermediate asymptotics and the

renormalisation group as natural consequences of self-similarity and shows how and when these notions and tools can be used to tackle the task at hand, and when they

cannot. Based on courses taught to undergraduate and graduate students, the book can also be used for self-study by biologists, chemists, astronomers, engineers

and geoscientists.
Framework for Structural Design
Material Characterization and Testing
Analysis of Concrete

Structures by Fracture Mechanics
Advanced Structural Mechanics
Structural Mechanics Fundamentals
Compares currently used

methods in determining concrete toughness and presents recommended test procedures with theories and models for describing cracking and fracturing phenomena. Effects of loading rate, temperature and humidity are also examined. Well

referenced and illustrated, this book is filled with practical technical information for materials and structural engineers.
This guidebook is a practical and essential tool providing everything necessary for

structural design engineers to create detailed and accurate calculations. Basic information is provided for steel, concrete and geotechnical design in accordance with Australian and international standards. Detailed design items are also provided,

especially relevant to the mining and oil and gas industries. Examples include pipe supports, lifting analysis and dynamic machine foundation design. Steel theory is presented with information on fabrication, transportation and costing, along

with member, connection, and anchor design. Concrete design includes information on construction costs, as well as detailed calculations ranging from a simple beam design to the manual production of circular column interaction diagrams. For

geotechnics, simple guidance is given on the manual production and code compliance of calculations for items such as pad footings, piles, retaining walls, and slabs. Each chapter also includes recommended drafting details to aid in the creation of

design drawings. More generally, highly useful aids for design engineers include section calculations and force diagrams. Capacity tables cover real-world items such as various slab thicknesses with a range of reinforcing options, commonly

used steel sections, and lifting lug capacities. Calculations are given for wind, seismic, vehicular, piping, and other loads. User guides are included for Space Gass and Strand7, including a non-linear analysis example for lifting lug design. Users are also

directed to popular vendor catalogues to acquire commonly used items, such as steel sections, handrails, grating, grouts and lifting devices. This guidebook supports practicing engineers in the development of detailed designs and refinement

of their engineering skill and knowledge.
In this volume on the mechanics of fracture of Portland cement concrete, the general theme is the connection between microstructural phenomena and macroscopic models. The issues

addressed include techniques for observation over a wide range of scales, the influence of .microcracking on common measures of strength and de formability , and ultimately, the relationship between microstructural changes in

concrete under load and its resistance to cracking. It is now commonly accepted that, in past attempts to force-fit the behavior of concrete into the rules of linear elastic fracture mechanics, proper attention has not been paid to scale effects. Clearly, the

relationships among specimen size, crack length and opening, and characteristic material fabric dimensions have been, in comparison to their counterparts in metals, ceramics, and rocks, abused in concrete. Without a fundamental understanding of

these relationships, additional testing in search of the elusive, single measure of fracture toughness has spawned additional confusion and frustration. No one is in a better position to document this observation than Professor

Mindess.
This book presents a complete and unified treatment of the fundamental themes of structural mechanics, ranging from the traditional to the most advanced topics, covering mechanics of linear elastic solids, theory of

beam systems, and phenomena of structural failure. The book considers explicitly all the static and kenetic operators of structural mechanics with their dual character. Topics relating to structural symmetry are covered in a single chapter while

dynamics is dealt with at various points. The logical presentation allows the clear introduction of topics such as finite element methods, automatic calculation of framed beam systems, plate and shell theory, theory of plasticity, and fracture mechanics.

Numerous worked examples, exercises with complete solutions and illustrations make it accessible both as a text for students and as a reference for research workers and practicing engineers.

Building Information Modeling

Condensed Isogeometric Analysis for Plate and Shell Structures
Nonlinear Crack Models for Nonmetallic Materials
Fractals and Fractional Calculus in Continuum Mechanics
Suspension Bridges and the Quest for Aerodynamic Stability

This is a single-source treatment of developments in TFT production from international specialists. It interweaves overlapping areas in multiple disciplines pertinent to transistor fabrication and

explores the killer application of amorphous silicon transistors in active matrix liquid crystal displays. It evaluates the preparation of polycrystallin The last decade has seen a significant growth in the

processing and fabrication of advanced composite materials. This volume contains the up-to-date contributions of those with working experience in the automotive, marine, aerospace and construction field. Starting

with modern technologies concerned with assessing the change in material microstructure in terms of the processing parameters, methodologies are offered to account for tradeoffs between

the fundamental variables such as temperature and pressure that control the product quality. The book contains new ideas and data, not available in the open literature.

Significant advances have been

made in non-explosive rock breaking techniques in the past two decades. This monograph focuses specifically on environmental-friendly rock excavating using chemical, thermal, hydraulic, electric and

hybrid systems. It presents a comprehensive overview of the theoretical concepts and state-of-the-art practical developments based on these emerging techniques.
This book contains detailed

information on the types, structure, fabrication, and characterization of organic solar cells (OSCs). It discusses processes to improve efficiencies and the prevention of degradation in OSCs. It

compares the cost-effectiveness of OSCs to those based on crystalline silicon and discusses ways to make OSCs more economical. This book provides a practical guide for the fabrication, processing, and

characterization of OSCs and paves the way for further development in OSC technology.

Dynamics and Restoration

Lectures on Fluid Mechanics and Mechanics of Deformable

Solids for Mathematicians and Physicists
A Unified Approach
Fracture Mechanics of Concrete Structures
Thin-Film Transistors
Structural MechanicsA

unified approachCRC Press
This book derives from the invited IUTAM Symposium in September 1993. The contributions discuss recent advances

in fracture mechanics studies of concrete, rock, ceramics and other brittle disordered materials at micro and structural levels. It draws together research

and new applications in continuum, damage and fracture mechanics approaches.
Building on the author's Structural Mechanics Fundamentals, this text

presents a complete and uniform treatment of the more advanced topics in structural mechanics, ranging from beam frames to shell structures, from dynamics to

buckling analysis, from plasticity to fracture mechanics, from long-span to high-rise civil structures. Plane frames Statically indeterminate beam systems: Method of

displacements Plates and shells Finite element method Dynamics of discrete systems Dynamics of continuous elastic systems Buckling instability Long-span

structures High-rise structures Theory of plasticity Plane stress and plane strain conditions Mechanics of fracture This book serves as a text for

graduate students in structural engineering, as well as a reference for practising engineers and researchers.

Proteins and macromolecular

structures represent one of the most important building blocks for a variety of biological processes. Their biological activity is performed in a dynamic

fashion, hence the concepts of waves and vibrations can help to explain how proteins function. This book has the goal of highlighting the importance of wave

and vibrational phenomena in the realm of proteins. It targets younger students as well as graduate researchers who work in various scientific fields and

are interested in learning how mechanical vibrations affect and drive the biological activity of proteins and macromolecular structures. Great

attention is given to the computational approaches dedicated to the evaluation of protein dynamics and biological behavior, and modern experimental

techniques are addressed as well. The book is written in a way that non-experts in the field can grasp most of the presented subjects. However, it is also

based on the most relevant and recent scientific literature, providing a rather comprehensive library for the reader eager to know more about specific

topics.
Application of Fracture Mechanics to Cementitious Composites
Fracture of Brittle Disordered Materials: Concrete, Rock and

Ceramics
Advanced Technology for Design and Fabrication of Composite Materials and Structures
The Theory of Critical Distances

Strength of Materials

This book presents the latest research findings of the fast developing applications of fracture mechanics to concrete structures. Key papers from leading experts in the field describe existing and new

modelling techniques in the analysis of materials and structures. The book explains the practical application of fracture mechanics to structural modelling, bending, shear, bond and anchorage. The proceedings of this RILEM Workshop will be

an important reference for those engaged in design, development, research and teaching in the field of concrete structures.

Portland cement concrete is a relatively brittle material. As a result, mechanical behavior of concrete, conventionally

reinforced concrete, prestressed concrete, and fiber reinforced concrete is critically influenced by crack propagation. It is, thus, not surprising that attempts are being made to apply the concepts of fracture mechanics to quantify the resistance to cracking in

cementious composites. The field of fracture mechanics originated in the 1920's with A. A. Griffith's work on fracture of brittle materials such as glass. Its most significant applications, however, have been for controlling brittle fracture and fatigue failure of

metallic structures such as pressure vessels, airplanes, ships and pipe lines. Considerable development has occurred in the last twenty years in modifying Griffith's ideas or in proposing new concepts to account for the ductility typical of metals. As a

result of these efforts, standard testing techniques have been available to obtain fracture parameters for metals, and design based on these parameters are included in relevant specifications. Many attempts have been made, in the last two

decades or so, to apply the fracture mechanics concepts to cement, mortar, con crete and reinforced concrete. So far, these attempts have not led to a unique set of material parameters which can quantify the resistance of these cementitious composites to

fracture. No standard testing methods and a generally accepted theoretical analysis are established for concrete as they are for metals.
This book gathers the peer-reviewed papers presented at the XXIV Conference of the Italian

Association of Theoretical and Applied Mechanics, held in Rome, Italy, on September 15-19, 2019 (AIMETA 2019). The conference topics encompass all aspects of general, fluid, solid and structural mechanics, as well as mechanics for machines and

mechanical systems, including theoretical, computational and experimental techniques and technological applications. As such the book represents an invaluable, up-to-the-minute tool, providing an essential overview of the most recent advances in the

field.
In this volume a survey of the most relevant nonlinear crack models is provided, with the purpose of analyzing the nonlinear mechanical effects occurring at the tip of macrocracks in quasi-brittle

materials - such as concrete, rocks, ceramics, polymers, high-strength metallic alloys - and in brittle-matrix fibre-reinforced composites. Such local effects, as, for example, plastic deformation, yielding, strain-hardening, strain-softening,

mechanical damage, matrix microcracking, aggregate debonding, fibre bridging, fibre slippage, crazing, and so on, are properly described through different simplified models, representing the peculiarities of the phenomena involved. The

models are introduced and described separately and then compared in the last part of the book. This volume will be of interest to students, professionals and researchers in the field of nonlinear fracture mechanics.

The Alkali-Silica Reaction in Concrete
Introduction to Earthquake Engineering
Fracture Mechanics Test Methods For Concrete
Applications of Fracture Mechanics to Reinforced

Concrete
Australian Guidebook for Structural Engineers