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| Computer Methods and Recent Advances in Geomechanics -Fusao Oka 2014-09-04 Computer Methods and Recent Advances in Geomechanics contains the proceedings (abstracts book 472 pages + full paper USB-drive 2052 pages) of the 14th International Conference of the International Association for Computer Methods and Advances in Geomechanics (Kyoto, Japan, 22-25 September, 2014). The contributions cover computer methods, material m |
| Geomechanics in Reservoir Simulation -Pascal Longuemare 2002 |
| Deformation and Progressive Failure in Geomechanics -T. Adachi 1997-11-06 Progressive failure has been a classical problem in the field of geotechnical engineering and has attracted considerable attention in connection with slope stability and foundation problems. It is associated with strain localization or shear banding and is also related to damage in material structures. As knowledge of the progressive failure mechanism increases, it is now necessary to establish effective communications between researchers and engineers. The International Symposium on Deformation and Progressive Failure in Geomechanics provided an opportunity for discussing recent advances in this area. A total of 136 papers were contributed from 22 countries. As well as these, the symposium proceedings also contain 8 interim technical reports on the subject by the members of the Asian Technical Committee of the International Society for Soil Mechanics and Foundation Engineering and the Japanese Geotechnical Society National Committee on Progressive Failure in Geo-structures. |
| Computer Methods and Advances in Geomechanics -Chandra S. Desai 2001 |

Eurock 2006: Multiphysics Coupling and Long Term Behaviour in Rock Mechanics-Alain van Cotthem 2006-04-27 Special emphasis is given to the constitutive behaviour of rock material, including rock mechanics and partial saturation, chemo-mechanics, thermo-hydro-mechanics, weathering and creep. Theoretical concepts, laboratory and field experiments and numerical simulations are discussed. Multiphysics coupling and long-term behaviour has practical applications in a number of areas. In oil engineering (enhanced oil recovery, CO2 injection, and well stability); in underground waste storage, post-mine behaviour and the long-term behaviour of railway and road infrastructures. This book will be useful to professionals and academics working in a variety of fields related to rock mechanics and environmental geotechnics. .

Poromechanics III - Biot Centennial (1905-2005)-Younane N. Abousleiman 2005-05-01 These proceedings represent the latest advances in the mechanics of porous materials, known as poromechanics. The porous materials considered are solids containing voids that are impregnated with fluid. The focus is on the mechanical interactions of the inhomogeneous solid with the single- or multi-phase fluid under the loading of mechanical force, fluid pressure, thermal, chemical, and magnetic fields. The response time can be in static, diffusional, and dynamic ranges. The length scale can start from nano, to micro, macro, and up to field scales. Its application covers many branches of science and engineering, including geophysics, geomechanics, composite materials, biomechanics, acoustics, seismicity, civil, mechanical, environmental, and petroleum engineering. The approaches taken include analytical, computational, and experimental. To honor the pioneering contributions of Maurice A. Biot (1905-1985) to poromechanics, the Biot Conference on Poromechanics was convened for the first time in Louvain-la-Neuve, Belgium in 1998. The success of the first conference led to the 2nd Biot Conference held in Grenoble, France in 2002. To celebrate the centennial birthday of Biot (May 25, 2005), the 3rd Biot Conference on Poromechanics was held at the University of Oklahoma, Norman, Oklahoma, U.S.A., on May 24-27, 2005.

Hydraulic Fracture Modeling-Yu-Shu Wu 2017-12-12 Hydraulic Fracture Modeling delivers all the pertinent technology and solutions in one product to become the go-to source for petroleum and reservoir engineers. Providing tools and approaches, this multi-contributed reference presents current and upcoming developments for modeling rock fracturing including their limitations and problem-solving applications. Fractures are common in oil and gas reservoir formations, and with the ongoing increase in development of unconventional reservoirs, more petroleum engineers today need to know the latest technology surrounding hydraulic fracturing technology such as fracture rock modeling. There is tremendous research in the area but not all located in one place. Covering two types of modeling technologies, various effective fracturing approaches and model applications for fracturing, the book equips today’s petroleum engineer with an all-inclusive product to characterize and optimize today’s more complex reservoirs. Offers understanding of the details surrounding fracturing and fracture modeling technology, including theories and quantitative methods Provides academic and practical perspective from multiple contributors at the forefront of hydraulic fracturing and rock mechanics Provides today’s petroleum engineer with model validation tools backed by real-world case studies

Applied Soil Mechanics with ABAQUS Applications-Sam Helwany 2007-03-16 A simplified approach to applying the Finite Element Method to geotechnical problems Predicting soil behavior by constitutive equations that are based on experimental findings and embodied in numerical methods, such as the finite element method, is a significant aspect of soil mechanics. Engineers are able to solve a wide range of geotechnical engineering problems, especially inherently complex ones that resist traditional analysis. Applied Soil Mechanics with ABAQUS® Applications provides civil engineering students and practitioners with a simple, basic introduction to applying the finite element method to soil mechanics problems. Accessible to someone with little background in soil mechanics and finite element analysis, Applied Soil Mechanics with ABAQUS® Applications explains the basic concepts of soil mechanics and then prepares the reader for solving geotechnical engineering problems using both traditional engineering solutions and the more versatile, finite element solutions. Topics covered include: Properties of Soil Elasticity and Plasticity Stresses in Soil Consolidation Shear Strength of Soil Shallow Foundations Lateral Earth Pressure and Retaining Walls Piles and Pile Groups Seepage Taking a unique approach, the author describes the general soil mechanics for each topic, shows traditional applications of these principles with longhand solutions, and then presents finite element solutions for the same applications, comparing both. The book is prepared with ABAQUS® software applications to enable a range of readers to experiment firsthand with the principles described in the book (the software application files are available under "student resources" at www.wiley.com/college/helwany). By presenting both the traditional solutions alongside the FEM solutions, Applied Soil Mechanics with ABAQUS® Applications is an ideal introduction to traditional soil mechanics and a guide to alternative solutions and emergent methods. Dr. Helwany also has an online course based on the book available at www.geomilwaukee.com.

Finite Element Analysis in Geotechnical Engineering-David M. Potts 2001 An insight into the use of the finite method in geotechnical engineering. The first volume covers the theory and the second volume covers the applications of the subject. The work examines popular constitutive models, numerical techniques and case

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studies.

Petroleum Related Rock Mechanics-Erling Fjar 2008-01-04 Engineers and geologists in the petroleum industry will find Petroleum Related Rock Mechanics, 2e, a powerful resource in providing a basis of rock mechanical knowledge - a knowledge which can greatly assist in the understanding of field behavior, design of test programs and the design of field operations. Not only does this text give an introduction to applications of rock mechanics within the petroleum industry, it has a strong focus on basics, drilling, production and reservoir engineering. Assessment of rock mechanical parameters is covered in depth, as is acoustic wave propagation in rocks, with possible link to 4D seismics as well as log interpretation. Learn the basic principles behind rock mechanics from leading academic and industry experts Quick reference and guide for engineers and geologists working in the field Keep informed and up to date on all the latest methods and fundamental concepts

Reservoir Geomechanics-Mark D. Zoback 2010-04-01 This interdisciplinary book encompasses the fields of rock mechanics, structural geology and petroleum engineering to address a wide range of geomechanical problems that arise during the exploitation of oil and gas reservoirs. It considers key practical issues such as prediction of pore pressure, estimation of hydrocarbon column heights and fault seal potential, determination of optimally stable well trajectories, casing set points and mud weights, changes in reservoir performance during depletion, and production-induced faulting and subsidence. The book establishes the basic principles involved before introducing practical measurement and experimental techniques to improve recovery and reduce exploitation costs. It illustrates their successful application through case studies taken from oil and gas fields around the world. This book is a practical reference for geoscientists and engineers in the petroleum and geothermal industries, and for research scientists interested in stress measurements and their application to problems of faulting and fluid flow in the crust.

Rock Mechanics for Resources, Energy and Environment-Marek Kwasniewski 2013-09-11 This book contains the Proceedings of EUROCK 2013 - The 2013 ISRM International Symposium, which was held on 23-26 September 2013 in Wroclaw, Poland. The Symposium was organized by the ISRM National Group POLAND and the Institute of Geotechnics and Hydrotechnics of the Wroclaw Institute of Technology. The focus of the Symposium was on recent develo

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| The Journal of Canadian Petroleum Technology - 2004 |
| SPE Drilling & Completion - 2009 |
| Geomechanics of Marine Anchors -Charles Aubeny 2017-09-18 This book provides a comprehensive guide for the analysis and design of anchor systems used for mooring offshore floating structures. Much of the experience is based on applications toward the offshore oil and gas industry, but the substantial potential for offshore renewable energy systems is addressed. The major types of anchors are described with respect to their basic design concept, advantages and limitations, appropriate framework for analysis, and observed performance. This book addresses all aspects of anchor behaviour related to anchor design including the installation performance, load capacity, deformation, and structural integrity of the anchor itself. Coverage is also provided of appurtenant components of anchor systems, in particular of anchor line/chain mechanics in the soil and water columns. Much of the material presented represents relatively new developments, including several new anchors which have been developed within the last decade, so the book will provide a useful compendium of information is largely scattered in journals and conference proceedings. This book is intended for engineers engaged in offshore geotechnics and marine engineers involved in mooring system and floating structure design. While the analytical methods presented in this text have a strong theoretical basis, the emphasis is on simplified computational formats accessible to design engineers. |

Geomechanics and Geodynamics of Rock Masses-Vladimir Litvinenko 2018-05-15 Geomechanics and Geodynamics of Rock Masses contains contributions presented at EUROCK 2018, the 2018 International Symposium of the International Society for Rock Mechanics (ISRM 2018, Saint Petersburg, Russia, 22-26 May 2018). Dedicated to recent advances and achievements in the fields of geomechanics and geotechnology, the main topics of the book include: - Physical and mechanical properties of fractured rock (laboratory testing and rock properties, field measurements and site investigations) - Geophysics in rock mechanics - Rock mass strength and failure - Nonlinear problems in rock mechanics - Effect of joint water on the behavior of rock foundation - Numerical modeling and back analysis - Mineral resources development: methods and rock mechanics problems - Rock mechanics and underground construction in mining, hydropower industry and civil engineering - Rock mechanics in petroleum engineering - Geodynamics and monitoring of rock mass behavior - Risks and hazards - Geomechanics of technogenic deposits Geomechanics and Geodynamics of Rock Masses will be of interest to researchers and professionals involved in the various branches of rock mechanics and rock engineering. EUROCK 2018, organized by the Saint Petersburg Mining University, is a continuation of the successful series of ISRM symposia in Europe, which began in 1992 in Chester, UK.

Casing Design - Theory and Practice-S.S. Rahman 1995-08-01 Casing design has followed an evolutionary trend and most improvements have been made due to the advancement of technology. Contributions to the technology in casing design have come from fundamental research and field tests, which have made casing safe and economical. This book gathers together much available information in the subject area and shows how it may be used in deciding the best procedure for casing design i.e. optimizing casing design for deriving maximum profit from a particular well. The problems and their solutions, which are provided in each chapter, and the computer program (3.5 in. disk) are intended to serve two purposes:- firstly, as illustrations for students and practicing engineers to understand the subject matter, and secondly, to enable them to optimize casing design for a wide range of wells to be drilled in the future.

Offshore Geotechnical Engineering-Mark Randolph 2017-07-12 Design practice in offshore geotechnical engineering has grown out of onshore practice, but the two application areas have tended to diverge over the last thirty years, driven partly by the scale of the foundation and anchoring elements used offshore, and partly by fundamental differences in construction and installation techniques. As a consequence offshore geotechnical engineering has grown as a speciality. The structure of Offshore Geotechnical Engineering follows a pattern that mimics the flow of a typical offshore project. In the early chapters it provides a brief overview of the marine environment, offshore site investigation techniques and interpretation of soil behaviour. It proceeds to cover geotechnical design of piled foundations, shallow foundations and anchoring systems. Three topics are then covered which require a more multi-disciplinary approach: the design of mobile drilling rigs, pipelines and geohazards. This book serves as a framework for undergraduate and postgraduate courses, and will appeal to professional engineers specialising in the offshore industry.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

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Core Analysis-Colin McPhee 2015-12-10 Core Analysis: A Best Practice Guide is a practical guide to the design of core analysis programs. Written to address the need for an updated set of recommended practices covering special core analysis and geomechanics tests, the book also provides unique insights into data quality control diagnosis and data utilization in reservoir models. The book's best practices and procedures benefit petrophysicists, geoscientists, reservoir engineers, and production engineers, who will find useful information on core data in reservoir static and dynamic models. It provides a solid understanding of the core analysis procedures and methods used by commercial laboratories, the details of lab data reporting required to create quality control tests, and the diagnostic plots and protocols that can be used to identify suspect or erroneous data. Provides a practical overview of core analysis, from coring at the well site to laboratory data acquisition and interpretation Defines current best practice in core analysis preparation and test procedures, and the diagnostic tools used to quality control core data Provides essential information on design of core analysis programs and to judge the quality and reliability of core analysis data ultimately used in reservoir evaluation Of specific interest to those working in core analysis, porosity, relative permeability, and geomechanics

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Numerical Analysis and Modelling in Geomechanics-John W. Bull 2003-09-02 In geomechanics, existing design methods are very much dependent upon sophisticated on-site techniques to assess ground conditions. This book describes numerical analysis, computer simulation and modelling that can be used to answer some highly complex questions associated with geomechanics. The contributors, who are all international experts in the field, also give insights into the future directions of these methods. Numerical Analysis and Modelling in Geomechanics will appeal to professional engineers involved in designing and building both onshore and offshore structures, where geomechanical considerations may well be outside the usual codes of practice, and therefore specialist advice is required. Postgraduate researchers, degree students carrying out project work in this area will also find the book an invaluable resource.

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High-Performance Bolting Technology for Offshore Oil and Natural Gas Operations-National Academies of Sciences, Engineering, and Medicine 2018-07-12 Commercially significant amounts of crude oil and natural gas lie under the continental shelf of the United States. Advances in locating deposits, and improvements in drilling and recovery technology, have made it technically and economically feasible to extract these resources under harsh conditions. But extracting these offshore petroleum resources involves the possibility, however remote, of oil spills, with resulting damage to the ocean and the coastline ecosystems and risks to life and limb of those performing the extraction. The environmental consequences of an oil spill can be more severe underwater than on land because sea currents can quickly disperse the oil over a large area and, thus, cleanup can be problematic. Bolted connections are an integral feature of deep-water well operations. High-Performance Bolting Technology for Offshore Oil and Natural Gas Operations summarizes strategies for improving the reliability of fasteners used in offshore oil exploration equipment, as well as best practices from other industrial sectors. It focuses on critical bolting"bolts, studs, nuts, and fasteners used on critical connections.

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Computational Methods for Multiphase Flows in Porous Media-Zhangxin Chen 2006-04-01 This book offers a fundamental and practical introduction to the use of computational methods. A thorough discussion of practical aspects of the subject is presented in a consistent manner, and the level of treatment is rigorous without being unnecessarily abstract. Each chapter ends with bibliographic information and exercises.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Geotechnical Fundamentals for Addressing New World Challenges-Ning Lu 2019-05-24 This single-volume thoroughly summarizes advances in the past several decades and emerging challenges in fundamental research in geotechnical engineering. These fundamental research frontiers are critically reviewed and described in details in lights of four grand challenges our society faces: climate adaptation, urban sustainability, energy and material resources, and global water resources. The specific areas critically reviewed, carefully examined, and envisioned are: sensing and measurement, soil properties and their physics roots, multiscale and multiphysics processes in soil, geochemical processes for resilient and sustainable geosystems, biological processes in geotechnics, unsaturated soil mechanics, coupled flow processes in soil, thermal processes in geotechnical engineering, and rock mechanics in the 21st century.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Theory of Linear Poroelasticity with Applications to Geomechanics and Hydrogeology-Herbert F. Wang 2017-02-15 The theory of linear poroelasticity describes the interaction between mechanical effects and adding or removing fluid from rock. It is critical to the study of such geological phenomena as earthquakes and landslides and is important for numerous engineering projects, including dams, groundwater withdrawal, and petroleum extraction. Now an advanced text synthesizes in one place, with one notation, numerous classical solutions and applications of this highly useful theory. The introductory chapter recounts parallel developments in geomechanics, hydrogeology, and reservoir engineering that are unified by the tenets of poroelasticity. Next, the theory's constitutive and governing equations and their associated material parameters are described. These equations are then specialized for different simplifying geometries: unbounded problem domains, uniaxial strain, plane strain, radial symmetry, and axisymmetry. Example problems from geomechanics, hydrogeology, and petroleum engineering are incorporated throughout to illustrate poroelastic behavior and solution methods for a wide variety of real-world scenarios. The final chapter provides outlines for finite-element and boundary-element formulations of the field's governing equations. Whether read as a course of study or consulted as a reference by researchers and professionals, this volume's user-friendly presentation makes accessible one of geophysics' most important subjects and will do much to reduce poroelasticity's reputation as difficult to master.

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Linear and Non-linear Numerical Analysis of Foundations-John W. Bull 2009-02-02 Correctly understanding, designing and analyzing the foundations that support structures is fundamental to their safety. This book by a range of academic, design and contracting world experts provides a review of the state-of-the-art techniques for modelling foundations using both linear and non linear numerical analysis. It applies to a range of infrastructure, civil engineering and structural engineering projects and allows designers, engineers, architects, researchers and clients to understand some of the advanced numerical techniques used in the analysis and design of foundations. Topics include: Ground vibrations caused by trains Pile-group effects Bearing capacity of shallow foundations under static and seismic conditions Bucket foundation technology for offshore oilfields Seismically induced liquefaction in earth embankment foundations and in pile foundations Free vibrations of industrial chimneys and TV towers with flexibility of the soil Settlements of high rise structures Seepage, stress fields and dynamic responses in dams Site investigation

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Geotechnical Safety and Risk IV-Limin Zhang 2013-11-15 Geotechnical Safety and Risk IV contains the contributions presented at the 4th International Symposium on Geotechnical Safety and Risk (4th ISGSR, Hong Kong, 4-6 December 2013), which was organised under the auspices of the Geotechnical Safety Network (GEOSNet), TC304 on Engineering Practice of Risk Assessment and Management and TC205 on Safety an

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Soil-Structure Interaction: Numerical Analysis and Modelling-J.W. Bull 2002-11-01 This book describes how a number of different methods of analysis and modelling, including the boundary element method, the finite element method, and a range of classical methods, are used to answer some of the questions associated with soil-structure interaction.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Numerical Methods in Industrial Forming Processes-J. F. T. Pittman 1982

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Petroleum Rock Mechanics-Bernt Aadnoy 2019-06-15 Petroleum Rock Mechanics: Drilling Operations and Well Design, Second Edition, keeps petroleum and drilling engineers centrally focused on the basic fundamentals surrounding geomechanics, while also keeping them up-to-speed on the latest issues and practical problems. Updated with new chapters on operations surrounding shale oil, shale gas, and hydraulic fracturing, and with new sections on in-situ stress, drilling design of optimal mud weight, and wellbore instability analysis, this book is an ideal resource. By creating a link between theory with practical problems, this updated edition continues to provide the most recent research and fundamentals critical to today's drilling operations. Helps readers grasp the techniques needed to analyze and solve drilling challenges, in particular wellbore instability analysis Teaches rock mechanic fundamentals and presents new concepts surrounding sand production and hydraulic fracturing operations Includes new case studies and sample problems to practice

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Trigger Effects in Geosystems-Gevorg Kocharyan 2019-11-16 This book is the result of collaboration within the frames of the 5th International Conference "Trigger Effects in Geosystems" held in the Institute of Geosphere Dynamics of Russian Academy of Sciences, June 2019. This book aims to raise awareness about different triggering aspects in the geosphere and its effects.The conference provided a multidisciplinary platform with a focus on (i) the influence of natural and anthropogenic factors on the geosphere, geomechanical systems and anthropogenic objects found in a subcritical state and (ii) the influence of these factors on the system "atmosphere - ionosphere". The problems considered in the book may be interesting for a wide audience including students, professionals, researches, and for the industry.

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Multiscale and Multiphysics Processes in Geomechanics-Ronaldo I. Borja 2011-05-10 This state-of-the-art book contains all results and papers of the International Workshop on Multiscale and Multiphysics Processes in Geomechanics at Stanford University Campus, June 23–25, 2010.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Rock Fractures and Fluid Flow-National Research Council 1996-08-27 Scientific understanding of fluid flow in rock fractures—a process underlying contemporary earth science problems from the search for petroleum to the controversy over nuclear waste storage—has grown significantly in the past 20 years. This volume presents a comprehensive report on the state of the field, with an interdisciplinary viewpoint, case studies of fracture sites, illustrations, conclusions, and research recommendations. The book addresses these questions: How can fractures that are significant hydraulic conductors be identified, located, and characterized? How do flow and transport occur in fracture systems? How can changes in fracture systems be predicted and controlled? Among other topics, the committee provides a geomechanical understanding of fracture formation, reviews methods for detecting subsurface fractures, and looks at the use of hydraulic and tracer tests to investigate fluid flow. The volume examines the state of conceptual and mathematical modeling, and it provides a useful framework for understanding the complexity of fracture changes that occur during fluid pumping and other engineering practices. With a practical and multidisciplinary outlook, this volume will be welcomed by geologists, petroleum geologists, geoengineers, geophysicists, hydrologists, researchers, educators and students in these fields, and public officials involved in geological projects.

Geotechnical Modelling-David Muir Wood 2017-12-21 Modelling forms an implicit part of all engineering design but many engineers engage in modelling without consciously considering the nature, validity and consequences of the supporting assumptions. Derived from courses given to postgraduate and final year undergraduate MEng students, this book presents some of the models that form a part of the typical undergraduate geotechnical curriculum and describes some of the aspects of soil behaviour which contribute to the challenge of geotechnical modelling. Assuming a familiarity with basic soil mechanics and traditional methods of geotechnical design, this book is a valuable tool for students of geotechnical and structural and civil engineering as well as also being useful to practising engineers involved in the specification of numerical or physical geotechnical modelling.

Forensic Geotechnical Engineering-V.V.S. Rao 2015-08-28 In this edited volume on advances in forensic geotechnical engineering, a number of technical contributions by experts and professionals in this area are included. The work is the outcome of deliberations at various conferences in the area conducted by Prof. G.L. Sivakumar Babu and Dr. V.V.S. Rao as secretary and Chairman of Technical Committee on Forensic Geotechnical Engineering of International Society for Soil Mechanics and Foundation Engineering (ISSMGE). This volume contains papers on topics such as guidelines, evidence/data collection, distress characterization, use of diagnostic tests (laboratory and field tests), back analysis, failure hypothesis formulation, role of instrumentation and sensor-based technologies, risk analysis, technical shortcomings. This volume will prove useful to researchers and practitioners alike.

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The Finite Element Method in the Deformation and Consolidation of Porous Media-Roland Wynne Lewis 1987

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Geologic Carbon Sequestration-V. Vishal 2016-05-11 This exclusive compilation written by eminent experts from more than ten countries, outlines the processes and methods for geologic sequestration in different sinks. It discusses and highlights the details of individual storage types, including recent advances in the science and technology of carbon storage. The topic is of immense interest to geoscientists, reservoir engineers, environmentalists and researchers from the scientific and industrial communities working on the methodologies for carbon dioxide storage. Increasing concentrations of anthropogenic carbon dioxide in the atmosphere are often held responsible for the rising temperature of the globe. Geologic sequestration prevents atmospheric release of the waste greenhouse gases by storing them underground for geologically significant periods of time. The book addresses the need for an understanding of carbon reservoir characteristics and behavior. Other book volumes on carbon capture, utilization and storage (CCUS) attempt to cover the entire process of CCUS, but the topic of geologic sequestration is not discussed in detail. This book focuses on the recent trends and up-to-date information on different storage rock types, ranging from deep saline aquifers to coal to basaltic formations.

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Programming the Finite Element Method-I. M. Smith 2005-06-10 This title demonstrates how to develop computer programmes which solve specific engineering problems using the finite element method. It enables students, scientists and engineers to assemble their own computer programmes to produce numerical results to solve these problems. The first three editions of Programming the Finite Element Method established themselves as an authority in this area. This fully revised 4th edition includes completely rewritten programmes with a unique description and list of parallel versions of programmes in Fortran 90. The Fortran programmes and subroutines described in the text will be made available on the Internet via anonymous ftp, further adding to the value of this title.

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Physical Properties of Rocks-Juergen H. Schön 2015-11-26 The interpretation of geophysical data in exploration geophysics, well logging, engineering, mining and environmental geophysics requires knowledge of the physical properties of rocks and their correlations. Physical properties are a "key" for combined interpretation techniques. The study of rock physics provides an interdisciplinary treatment of physical properties, whether related to geophysical, geotechnical, hydrological or geological methodology. Physical Properties of Rocks, 2nd Edition, describes the physical fundamentals of rock properties, based on typical experimental results and relevant theories and models. It provides readers with all relevant rock properties and their interrelationships in one concise volume. Furthermore, it guides the reader through experimental and theoretical knowledge in order to handle models and theories in practice. Throughout the book the author focuses on the problems of applied geophysics with respect to exploration and the expanding field of applications in engineering and mining geophysics, geotechnics, hydrology and environmental problems, and the properties under the conditions of the upper Earth crust. Physical Properties of Rocks, Second Edition, guides readers through a systematic presentation of all relevant physical properties and their interrelationships in parallel with experimental and theoretical basic knowledge and a guide for handling core models and theories

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Geotechnical and Geophysical Site Characterisation 5-Barry M. Lehane 2016-12-23 Proceedings of the Fifth International Conference on Geotechnical and Geophysical Site Characterisation (ISC'75) held from September 5th to 9th 2016, Gold Coast, Australia

Stress Field of the Earth's Crust-Arno Zang 2009-12-06 Stress Field of the Earth's Crust is based on lecture notes prepared for a course offered to graduate students in the Earth sciences and engineering at University of Potsdam. In my opinion, it will undoubtedly also become a standard reference book on the desk of most scientists working with rocks, such as geophysicists, structural geologists, rock mechanics experts, as well as geotechnical and petroleum engineers. That is because this book is concerned with what is probably the most peculiar characteristic of rock - its initial stress condition. Rock is always under a natural state of stress, primarily a result of the gravitational and tectonic forces to which it is subjected. Crustal stresses can vary regionally and locally and can reach in places considerable magnitudes, leading to natural or man-made mechanical failure. Pre-existing stress distinguishes rock from most other materials and is at the core of the discipline of "Rock Mechanics", which has been developed over the last century. Knowledge of rock stress is fundamental to understanding faulting mechanisms and earthquake triggering, to

designing stable underground caverns and productive oil fields, and to improving mining methods and geothermal energy extraction, among others. Several books have been written on the subject, but none has attempted to be as all-encompassing as the one by Zang and Stephansson.