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Theory of Linear Poroelasticity with Applications to ...

Linear poroelasticity is a theory that includes the coupling between linear diffusion of a mobile species and the stress and deformation of a linear elastic porous solid. This theory has been widely applied not only to soils and rock masses infiltrated by groundwater but also to coupling of fluid flow and

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Theory of Linear Poroelasticity with Applications to Geomechanics and Hydrogeology Herbert F. Wang PRINCETON UN IV E RSITY PRESS · PRINCETON ANO OXFORD . Contents PREFACE xi 1. Introduction 3 1.0 Chapter Overview 3 1.1 Historical 1 Examp1es 3 1.2 Basic Concepts 5 1.3 Brief ...

[1607.04274] An introduction to linear poroelasticity

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Theory of Linear Poroelasticity—with Applications to ...

This book treats the mechanics of porous materials infiltrated with a fluid (poromechanics), focussing on its linear theory (poroelasticity). Porous materials from inanimate bodies such as sand, soil and rock, living bodies such as plant tissue, animal flesh, or man-made materials can look very different due to their different origins, but as readers will see, the underlying physical ...

2014 Drucker Medal Paper: A Derivation of the Theory of ...

Theory of linear poroelasticity with applications to geomechanics and hydrogeology:: Princeton University Press; ISBN 0-691-03746-9; Author Herbert F. ...

Poroelasticity - Wikipedia

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.

Linear Poroelasticity - Environmental Engineering

Theory of Linear Poroelasticity—with Applications to Geomechanics and Hydrogeology Herbert F. Wang, Princeton University Press, 2000, 287 pp, ISBN 0-691-03746-9, Hardback, \$65.00 Theory of Linear Poroelasticity—with Applications to Geomechanics and Hydrogeology

Theory Of Linear Poroelasticity With

Definition. Poroelasticity is a field in materials science and mechanics that studies the interaction between fluid flow and solids deformation within a linear porous medium and it is an extension of elasticity and porous medium flow (diffusion equation). The deformation of the medium influences the flow of the fluid and vice versa. The theory was proposed by Maurice Anthony Biot (1935, 1941 ...

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Title: An introduction to linear poroelasticity. Authors: Andi Merxhani. Download PDF Abstract: This study is an introduction to the theory of three-dimensional consolidation. The point of departure in the description are the basic equations of elasticity (i.e. constitutive law, equations of equilibrium in terms of stresses, ...

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8 CHAPTER1. INTRODUCTION 1.3 BRIEFHISTORY Importantconce
ptsofporoelasticitydevelopedsomewhatindependentlyin
geomechanics,petroleumengineering,andhydrogeology ...

Emmanuel Detournay and Alexander H.-D. Cheng

standard theory of linear poroelasticity. 1 This statement is not intended to imply that the widely-used constitutive equations for linear poroelasticity are thermody- namically inconsistent, but instead to reflect the fact that thermodynamics is seldom used consistently in their derivation.

Poroelasticity | Alexander H.-D. Cheng | Springer

idation. This theory was generalized to three-dimensions by Rendulic² in 1936. However, it is Biot who in 1935³ and 1941⁴ first developed a linear theory of poroelasticity that is con-sistent with the two basic mechanisms outlined above. Essentially the same theory has been

Chapter 7. Introduction to Poroelasticity Theory ...

This study is an introduction to the theory of poroelasticity expressed in terms of Biot's theory of three- dimensional consolidation. ... An introduction to linear poroelasticity. July 18, 2016.

Herbert F. Wang: Theory of Linear Poroelasticity with ...

In a series of papers published between 1935 and 1957 Biot developed the theory of dynamic poroelasticity (now known as Biot theory) which gives a complete and general description of the mechanical behaviour of a poroelastic medium. Biot's

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equations of the linear theory of poroelasticity are derived from

Theory of Linear Poroelasticity - UniTrento

Another distinction between the theory of poroelasticity and the more "primitive" approach developed in the preceding chapters is that in contrast to the theory of hydrostatic compression, which can be developed in a fully nonlinear form, a usable theory of poroelasticity that accounts for the stress-dependence of the elastic moduli is still in the process of development.

(PDF) An introduction to linear poroelasticity

This article is a review of: Theory of linear poroelasticity with applications to geomechanics and hydrogeology Princeton University Press; ISBN 0-691-03746-9; Author Herbert F. Wang, 2000, 287 pp.

Poromechanics - Wikipedia

Linear poroelasticity is a theory that includes the coupling between linear diffusion of a mobile species and the stress and deformation of a linear elastic porous solid. This theory has been widely applied not only to soils and rock masses infiltrated by groundwater but also to coupling of fluid flow and deformation in biological materials and diffusion of hydrogen in metals.

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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.

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