

# Theory Of Linear Poroelasticity With Applications To Geomechanics And Hydrogeology

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## Theory Of Linear Poroelasticity With

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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.

## Poroelasticity - Wikipedia

8 CHAPTER1. INTRODUCTION 1.3 BRIEFHISTORY Importantconceptsofporoelasticitydevelopedsomewhatindependentlyin geomechanics,petroleumengineering,andhydrogeology ...

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

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

## Linear Poroelasticity - Environmental Engineering

Linear poroelasticity models have a number of important applications in biology and geophysics. In particular, Biot's consolidation model is a well-

known model that describes the coupled ...

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This study is an introduction to the theory of poroelasticity expressed in terms of Biot's theory of three-dimensional consolidation. The point of departure in the description are the basic ...

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## **[1607.04274] An introduction to linear poroelasticity**

Biot's equations of the linear theory of poroelasticity are derived from Equations of linear elasticity for the solid matrix, Navier-Stokes equations for the viscous fluid, and Darcy's law for the flow of fluid through the porous matrix.

## **Poromechanics - Wikipedia**

The earliest theory to account for the influence of pore fluid on the quasi-static deformation of soils was developed in 1923 by Terzaghi<sup>1</sup> who proposed a model of one-dimensional consolidation. This theory was generalized to three-dimensions by Rendulic<sup>2</sup> in 1936.

## **Emmanuel Detournay and Alexander H.-D. Cheng**

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

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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

## **Poroelasticity | Alexander H.-D. Cheng | Springer**

The purpose of this brief paper is to present a new derivation of Biot's theory of linear poroelasticity (Biot, M., 1935, "Le Problème de la Consolidation des Matières Argile

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