CEE AT ILLINOIS
Department of Civil and Environmental Engineering

GEO

CEE 595 – Geotechnical Engineering Seminar

Friday, October 20, 2017
11:00AM, Newmark Lab 3310

Poromechanical aspects of geo-energy applications

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Abstract

This talk will introduce the newest CEE research group. Rock mechanics lab at Illinois develops novel testing methods for studying the response of fluid-saturated rock at elevated temperatures and pressures and fracturing and multi-axial failure of rock at different scales for the applications that involve energy production and deep waste storage.

Shallow sedimentary formations are being considered for geo-energy applications, including CO_2 and nuclear waste storage and enhanced geothermal systems. Proper functioning of the related projects requires accurate characterization of hydro-mechanical behavior of the rock. Experimental techniques are developed to saturate high-permeable (sandstones and limestones) and low-permeable geomaterials (shales) with different fluids, including oil, water, brine, and carbon dioxide. High-pressure conventional triaxial, oedometric, and plane strain compression testing methods are utilized to measure poroelastic, inelastic, failure, and flow properties. Additionally, thermal and viscous effects are found to have important implications for long-term storage projects.