

Department: Mining Engineering

Division: Rock Mechanics

Level and Major: Ph.D., Rock Mechanics

Course Title: Coupled Processes in Rock Mechanics

Number of Credits: 3

Lecturer: Dr. Saeid Nikoosokhan

Course Goals and Objectives

Learning Fundamentals of Poromechanics and application of these concepts in coupling processes.

Course Topics

- Introduction and Course Overview
- Coupling Applications in Petroleum Geomechanics
- Coupling between Pore pressure and Stress
- Constitutive Equations
- Linear Isotropic Theory of Poroelasticity
- Fundamental Problems (Uniaxial strain, Plane strain, Plane stress, Axisymmetry)
- Developing Thermo-hydro-chemo-mechanical coupled models
- Developing Constitutive Equations for Dual Porosity Media

Reading Resources

- Wang, H.F. (2000). Theory of linear poroelasticity with applications to geomechanics and hydrogeology. Princeton University Press.
- Coussy, O. (2005). Poromechanics. Wiley and Sons.
- Coussy, O. (2010). Mechanics and Physics of Porous Solids. Wiley and Sons.