



“Fundamentals of flow and transport in porous media”

Lecturer: dr hab. inż. Adam Szymkiewicz

Motivation and objective

Many engineering problems deal with flow and transport in porous materials, such as soils, rocks, concrete, paper or biological tissues. The objective of this course is to provide a consistent framework for the description of such processes, based on the principles of mass, momentum and energy conservation. Applications in the fields of geotechnics, hydrogeology, environmental protection and building physics will be discussed. Advanced topics such as flow and transport in heterogeneous and fractured porous media will be also dealt with.

Scope

- general characteristics of porous media, observation scales
- single phase flow
- transport of dissolved substances
- multiphase flow and transport
- heat transport
- flow and transport in fractured media, upscaling

Expected effects for students

Thorough understanding of physical principles of different flow and transport phenomena in porous materials important in civil and environmental engineering. Ability to choose the correct mathematical model for specific problem and to apply appropriate material parameters and boundary conditions necessary to solve the governing equations. Knowledge of basic techniques applied to modeling of heterogeneous and multiple porosity media.



TERMINY WYKŁADÓW			
Data	Dzień tygodnia	Godzina	Sala
2014-02-04	wtorek	9.00-14.00	Hydro 301
2014-02-05	środa	9.00-14.00	Hydro 301
2014-02-06	czwartek	9.00-14.00	Hydro 301