A 3-D program for thermo-hydro-mechanical analysis in geological media

Description

CODE_BRIGHT is a general-purpose finite element program developed by the Department of Geotechnical Engineering and Geosciences of the Universitat Politécnica de Catalunya (DIT-UPC) for the analysis of coupled thermo-hydro-mechanical (THM) phenomena in geological media.

The development of CODE_BRIGHT started in 1990 with the purpose of modelling the response of saline materials in the context of deep nuclear waste disposal. The initial capabilities were soon extended to include a wider range of geological materials and, in particular, unsaturated soils. General transport processes and their interaction with the material mechanical behaviour were added in order to develop a generalised tool for THM analysis. CODE_BRIGHT has been extensively verified and validated in international benchmark exercises. It has been applied to the analysis of different geoenvironmental schemes and waste disposal designs. In the recent past many other relevant geotechnical problems involving saturated/ unsaturated flow and stress strain behaviour have been analysed with the help of CODE_BRIGHT. The course will provide an appropriate coverage of theoretical background, numerical aspects, details of problem solving and examples of application.

CODE_BRIGHT is backed by a detailed reference and Tutorial Manual, a description of the Theoretical Bases and a publication on Validation Exercises solved with the code. Course material includes the Theoretical Background and Validation documents as well as a copy of relevant publications.

Program

Bring your own laptop with windows installed and internet access.(**重要：** 请自带 windows 操作系统的笔记本电脑，需有上网功能)

First day (24th August 2015) 岩土楼 207

14:00-15:00	Fundamentals. General structure of Code_Bright and capabilities. Code_Bright and GiD installation and guidance.
15:00-18:00	Tutorial practice: Basic problems (shallow foundation, heat flow, open channel flow, hydraulic_solute problem, gas injection)

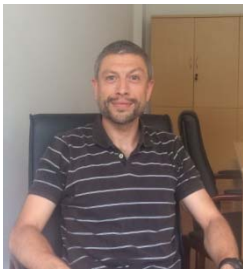
Second day (25th August 2015) 岩土楼 207

14:00-15:00	Boundary conditions. Constant flow, constant pressure. Excavation-construction. Atmospheric. Mock-up tutorial example. Pre and post-processing (GiD)
15:00-18:00	Tutorial practice: Advanced problems (DAM, mock-up test, Sequential Excavation Method –SEM–, shear hydraulic test)

Third day (26th August 2015) 岩土楼 207

14:00-15:00	Application: Analyses of expansive clay sealing systems in deep geological disposal of radioactive waste
15:00-18:00	Tutorial practice: Advanced problems (consolidation joint element, CO2 injection, BExM, atmospheric)

Instructor



Dr. Alfonso Rodriguez-Dono works as a post-doctoral researcher in Rock Mechanics and Numerical Modeling at CSIC -the biggest public research center of Spain and the third in Europe- and as an associate professor at the Technical University of Catalunya (UPC) in Spain, giving classes about both Mining Sustainability and Geotechnical Engineering. His current research interests include development, simulation and implementation of behavioral models of rocks and soils in numerical programs and mining sustainability.

Prior to joining the University of UPC, he has worked as a researcher at the University of Vigo on different topics, including rock mass post-failure behavior applied to tunneling design and simulation of underground excavations in rock masses. He obtained his PhD degree from University of Vigo in 2011 in Geotechnical Engineering and received the International Master's degree on Sustainable Exploitation of Mineral Resources from Technical University of Madrid in 2008.

If you have any questions please ask in the Code_Bright forum: bit.ly/forum_code_bright.