GEOS8AA GEOMECHANICAL MODELLING

GEOS8AA **Geomechanical Modelling**	**ECTS Credits : 2** **Duration: 21 hours**	**Semester : S8**

Person(s) in charge :

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Keywords : Numerical modelling, finite elements method, distinct elements method

Prerequisites : Modules ST032 et ST033 ou équivalents

Objective :

This course deals with the analytical and digital modelling tools used specifically in geoengineering. The use of these tools is taught through a detailed study and calculations for underground and surface structures with complex geometry as well as a modelisation of continuous and discontinuous rock masses.
This course incites students to use the knowledge acquired in other courses taught in the school (numerical methods, Continuum mechanics, etc.) by adapting them to geoengineering applications. It will allow them to judiciously evaluate the possibilities and limitations of modelling as well as the precautions to take when interpreting results.

Program and content:

Emphasis is placed on numeric methods concerning stress and strain, which is based on the assimilation of land to a continuous environment and, in particular, on the finite element method. An example is dealt with “by hand”, then with the aid of CESAR-LCPC software.
The classes that follow are devoted to numeric questions, different behavioural laws, then discontinuous modelling (the discrete element method is used with UDEC software) and illustrated with cases of underground or above-ground structures.

Abilities:

Levels	Description and operationnal verbs
Know	Know the main principles and main characteristics of the numerical modeling methods used in geomechanics
understand	Understand the fundamental differences between groups of numerical methods and be able to decide the most efficient for a specific case
Apply	Be able to use the main specialized codes threw simple case studies: simple geometry, simple stress sollicitations and be able to define criteria to decide of a computation convergence
Analyse	Be able to interpret results of a numerical modelisation to check the consistency and be able to make conclusion concerning a case study
Summarise	
Assess	

Evaluations :

☑ Written test	☑ Continuous control	☐ Oral report	☐ Project	☑ Written report