GEOS7AC ENGINEERING GEOLOGY

GEOS7AC Engineering Geology	ECTS Credits : 2 Durée : 21 heures	Semester : S7

Person(s) in charge:

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keywords : Geology, Rocks, Minerals, Petrophysics, Ressources

Prérequisites : /

Objectives :

Program and content :

Basics of crystallography and mineralogy

- mineral, crystal
- elements of symmetry and crystalline systems - TP
- faces and morphologies
- study of some common minerals, main identification criteria

Sedimentary rocks

- the sedimentary cycle – types and formation of rocks
- how to describe sedimentary rock
  structure and texture, elements and sediments, matrix and cement, granulometry
- *identification of common rocks: sandstones, carbonates, clays - TP*

Oil field and reservoir rocks

- sedimentary basins and Paris Basin Story
- diagenesis
- reservoirs and cap rocks
- oil exploration drilling and production
- *case study*
- *3D modeling* of oil reservoir - gocad (paradigm)

Magmatic rocks

- introduction to magmatism
- magmas: partial melting and fractionated cristallization
- granitic and basaltic magmas
- plutonic and volcanic rocks - *case study on volcanic hazards*
- classifications: structures and textures, compositions et chemical affinity and mineralogical associations
- *TP: identification of some common rocks*

Cartography and rock outcrop analysis

- the Geological map of France

Abilities:

Levels	Description and operational verbs
Know	Basics of Geology - Geological processes - Rock formation and evolution - Vocabulary of geosciences
understand	Rock cycle and main petrogenetic processes (sedimentation, magmatism)
Apply	Describe the rock mineralogy, petrography, textures, structures. identify the rock origin and formation, its structural evolution. Identify mineral and natural ressources.
Analyse	Be able to precisely describe and identify a rock. From this identification, be able to deduce petrophysical properties and geochemistry.
Summarise	Be able to observe and identify the rocks at various scales: from the field observations to the geotechnical and civil engineering uses.

Assess	From a rock identification, be able to propose expertise of the use, qualification, exploitation of such a natural material in civil and geotechnical engin eering.			
Evaluations :				
☑ Written Test	☑ Continuous control	☐ Oral presentation	☐ Project	☐ Written report