CIVIL-428

Engineering geology for geo-energy

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Cursus	Sem.	Type
Civil Engineering	MA2, MA4	Opt.
Energy minor	E	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	**3 weekly**
Lecture	2 weekly
Exercises	1 weekly
Number of positions	

Summary

Objective is to provide an understanding of the problems in geo-energy projects. Underground as storage medium for carbon dioxide, heat storage and radioactive waste and as energy source like deep geothermal systems.

Content

Keywords

structural geology, tectonics, natural and induced seiscimicity, stress measurements, borehole stability, hydraulic fracturing, deep geological disposal for radioactive wastes, deep geothermal systems, CO2 sequestration, heat storage

Learning Prerequisites

Required courses

Soil mechanics, Geomechanics, Rock mechanics

Learning Outcomes

By the end of the course, the student must be able to:

- Construct a coherent geological model with the available data.
- Anticipate the rock mass and hydraulic perturbations for any subsurface projects (i.e. deep geothermal, CO2 storage, construction of deep geological disposal for radioactive waste).
- Design the rock mass and hydraulic perturbations for any subsurface projects (i.e. deep geothermal, CO2 sequestration,construction of deep geological disposal for radioactive waste).
- Use correctly the acquired data in the project for building a coherent interpretation.

Transversal skills

- Access and evaluate appropriate sources of information.
- Continue to work through difficulties or initial failure to find optimal solutions.
- Demonstrate the capacity for critical thinking

Teaching methods

Teaching, exercises, personal project

Expected student activities

Attendance at lectures, completing exercices, reading selected scientific publications and doing a personal work

Assessment methods

During the semester, written control and personal work.

Resources

Notes/Handbook

- Elements of crustal geomechanics / Cornet F.H.

Moodle Link

- https://go.epfl.ch/CIVIL-428

Prerequisite for