

ENERGY GEOSTRUCTURES

2024-2025 Course Introduction

LECTURER & ASSISTANTS

2

LYESSE
LALOU

Lecturer



ELENA
RAVERA

Lecturer



SOFIE
TEN BOSCH

Assistant



ENERGY GEOSTRUCTURES 2024-2025

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COURSE CONTENT

GEOTECH AND STRUCTURAL ASPECTS

- Deformation and strength in the context of energy geostructures
- Thermo-mechanical behaviour of single and groups of energy piles, energy walls and tunnels
- Thermo-hydro-mechanical behaviour of soils

ENERGY ASPECTS

- Heat and mass transfers in the context of energy geostructures
- Analytical modelling of steady and transient heat transfer

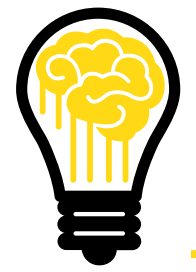
DESIGN; SUSTAINABILITY; ECONOMICS, APPLICATION

- In-situ and lab testing
- Extensions of Eurocodes
- Technoeconomic and Environmental assessment
- Energy pile, wall and tunnel applications



TEACHING

- **Ex-cathedra discussions (2 hours)**
 - Principal lecturer
 - Invited lecturers
- **Exercises sessions (1 hour)**
 - 5 exercises to hand-in
- **Design project**
 - Dedicated hours during the course
 - Office hours

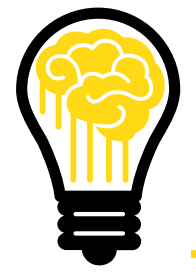


TEACHING SUPPORT

- Slides
- Moodle
- Book “Analysis & design of energy geostructures: theoretical essentials and practical application” (available online, BEAST EPFL)

EVALUATION (4 ECTS)

- Final written exam: 45% of the final mark
- 5 assigned exercises: 25% of the final mark
- Design project report: 20% of the final mark
- Oral presentation of the project: 10% of the final mark



DESIGN PROJECT INTRODUCTION

- Design of a building of your choice
 - Conventional geotechnical and structural design of the foundations
 - Thermo-mechanical verification of the foundations
 - Energy design of the foundations
 - Environmental and technoeconomic analysis
- Project submission comprises :
 - Technical report
 - Technical schemes of the foundations

Detailed information will be presented during the course



Office hours

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