

IDENTIFICATION

Course code : E5BE9CB1
ECTS : 2.5

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 16
Total : 32

Project :
Personnal work :

ASSESSMENT

The requested work involves designing a positive-energy building. Deliverables include an environmental and architectural report, which will be the subject of an oral presentation. The final grade comprises : - Environmental report + oral presentation : coefficient 2/3. - POE lab work grade : coefficient 1/3.

TEACHING MATERIALS

PowerPoint presentations

LANGUAGE

English

CONTACT

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Modifié le : 3 août 2026

UE : Conception

COURSE : NetZEB, POE, Sustainable design

SCOPE OF THE COURSE

OBJECTIVES

The objectives of this course are :
To design a positive-energy building in a tropical environment
To conduct an evaluation in occupied mode.

COMPETENCE AND SKILLS

To be able to design a bioclimatic positive-energy building with energy sobriety and renewable energy production objectives.
To be able to perform an energy and environmental assessment of positive-energy buildings during the design phase.
To be able to conduct an occupied-mode evaluation of buildings (assessment of energy performance and thermal comfort).

PROGRAM

NET ZERO ENERGY BUILDINGS :

- Definition. Presentation of key documents and indicators : Energy Building Performance Directive, Mismatch factor. Review of primary energy to final energy conversion coefficients. Study perimeter concept
- What design tools for Net ZEBs ?
- Architecture and Net ZEBs. What architectural evolutions and solutions to achieve zero energy ?
- Presentation of various positive-energy buildings worldwide.

POST OCCUPANCY EVALUATION :

- Presentation of various POE methods.
- Case studies of several existing buildings.

LAB WORK :

- Occupied-mode evaluation of a positive-energy building. Comfort questionnaires are completed by users. Concurrently, comfort conditions are measured in classrooms and offices.
- Monitoring of energy consumption and analysis of a positive-energy building by usage type.

BIBLIOGRAPHY

Garde F. et al (2017). Solution Sets for Net-Zero Energy Buildings : Feedback from 30 Buildings worldwide. Wiley and son. ISBN :9783433030721

REQUIREMENTS

- S6 - Heat transfer. Thermal load balance of a building. Comfort and design in a tropical environment. SketchUp.
- S8 - Software tools in energy simulation. Solar renewable energy.
- S9 - Software tools in energy simulation 2.