

IDENTIFICATION

Course code : E5BE9CB3
ECTS : 1.5

DURATION

Lectures : 2
Tutorial classes : 2
Labs : 16
Total : 20

Project :
Personnal work :

ASSESSMENT

1 project note

TEACHING MATERIALS

Handouts and PowerPoint presentations

LANGUAGE

English

CONTACT

Mathieu DAVID
mathieu.david@univ-reunion.fr

Modifié le : 3 août 2026

UE : Conception

COURSE : Software Tools in Energy Simulation 2

SCOPE OF THE COURSE

OBJECTIVES

Natural Building Design in Natural and Mixed-Mode Ventilation

COMPETENCE AND SKILLS

After this course, students must be able to perform an energy simulation of a multizone building using the EnergyPlus calculation code. They must also be able to present the results obtained in a report, including regulatory or incentive aspects (label).

PROGRAM

0.0.1 Part I : Multizone Simulation and Natural Ventilation

- Multizone modeling (inter-zonal and simplifying assumptions)
- Review of parameters influencing mass transfers at openings
- Nodal models and natural ventilation models
- Modeling natural ventilation : from simple to detailed models
- Critical analysis of results

0.0.2 Part II : Simulation and Standards (Regulations and Labels)

- Complementarity between regulation and simulation
- Examples with the PERENE framework

0.0.3 Part III : Project

- Architectural optimization of a multizone building through application of a regulation or label
- Realistic simulation of user behavior and systems to obtain an estimated building consumption ratio
- Drafting of a study report

BIBLIOGRAPHY

Energy simulation in building design. J.A. Clarke. Second Edition, Butterworth-Heinemann, Oxford, 2001. EnergyPlus version 8 manual

REQUIREMENTS

Thermal transfers, modeling tools (initiation to EnergyPlus or equivalent)