

IDENTIFICATION

Course code : ESI-SPI-CI-BE4-
S7-UE2-EC2
ECTS : 1

DURATION

Lectures :	4
Tutorial classes :	12
Labs :	0
Total :	16

Project :
Personnal work :

ASSESSMENT

1 project grade

TEACHING MATERIALS

PowerPoint presentations, EnergyPlus package, plans

LANGUAGE

English

CONTACT

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UE : UE7-QEB

COURSE : Dynamic Thermal Simulation 2

SCOPE OF THE COURSE

OBJECTIVES

Design of buildings with natural ventilation and mixed-mode systems

COMPETENCE AND SKILLS

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

PROGRAM

Part I : Multi-zone simulation and natural ventilation - Multi-zone modeling (inter-zone and simplifying assumptions) - Review of parameters influencing mass transfers at openings - Nodal models and natural ventilation models - Natural ventilation modeling : from simple to detailed models - Critical analysis of results

Part II : Simulation and regulations (regulations and labels) - Complementarity between regulation and simulation - Examples with the PERENE framework

Part III : Project - Architectural optimization of a multi-zone building by applying a regulation or a label - Realistic simulation of user behavior and systems to obtain an estimated consumption ratio for the building - Writing a study report

BIBLIOGRAPHY

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

REQUIREMENTS

Heat transfer, modeling tools (introduction to EnergyPlus or equivalent)