

IDENTIFICATION

Course code : E3B65QE2
ECTS : 2.5

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 4
Total : 20

Project :
Personnal work :

ASSESSMENT

Case study on a building project in a defined city/country. Assessment will be based on a written report and an oral presentation. The final grade will be calculated as 2/3 written report + 1/3 oral presentation.

TEACHING MATERIALS

PowerPoint presentation.

LANGUAGE

English

CONTACT

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UE : UE6.2-QEB

COURSE : Bioclimatic Design and Comfort

SCOPE OF THE COURSE

OBJECTIVES

The aim of this course is to provide students with the working methods and tools to enable them to design low-environmental-impact buildings in tropical environments.

COMPETENCE AND SKILLS

- Identify passive design strategies (thermal inertia, natural ventilation, insulation, solar shading, etc.) based on climate type.
- Be able to draw inspiration from vernacular architecture to innovate and design future low-environmental-impact buildings.
- Be capable of designing passive buildings in tropical environments.

PROGRAM

COMFORT :

1. The different parameters involved in comfort : (air temperature, mean radiant temperature, air velocity, humidity, clothing, metabolism)
2. Resultant temperature and operative temperature
3. Givoni diagram
4. Adaptive comfort
5. Current standards (ISO 7730, ASHRAE Standard 55, EN15251)

SUSTAINABLE BUILDING DESIGN IN TROPICAL ENVIRONMENTS :

1. Units, energy ratios, primary energy, final energy
2. Key design principles in tropical environments
3. Building surroundings
4. Cross-ventilation
5. Solar shading (roof, opaque walls, glazing)
6. Energy efficiency of systems (air conditioning, ceiling fans, artificial lighting)
7. Building diagnostics (analysis of EDF bills, energy-consuming systems, proposed solutions and costing).

BIBLIOGRAPHY

UN-Habitat : Sustainable Architectural Design in Tropical Environments. Principles and Applications for East Africa. ISBN : 978-92-1-132573-7

<http://andrewmarsh.com/software/>

REQUIREMENTS