The University of Illinois at Champaign-Urbana, School of Architecture

SPRING 2021
(Conference)
3 credit hours
Online-only via Zoom
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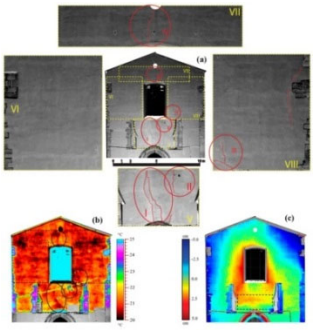
ARCH 576 CLI

CLIMATE DESIGN (3 Credits)

Professor Dr. Ralph Hammann



Overview

The course introduces sustainable concepts for building enclosure design in various climate regions. We will first learn from examples of vernacular building and façade designs in hot-arid, hot-humid, and moderate climates and how these concepts may be used in creating modern buildings which use less energy, are more comfortable for users, provide a healthier environment, use extensive day lighting, and provide proper shading. The course will present the key metrics for determining wall enclosure and glazing efficiencies, such as R-/U-values, solar heat gain coefficients, emissivity, transmissivity, radiation and absorption and how they are calculated and applied.
The seminar is organized into **alternating lecture/discussion and case study sessions.**
This is an online-only course offering.

Course Structure

The seminar consists of the following components:

a) **Climate**: **What** do we need to understand, **How** do we need to incorporate climate parameters. **Why** is this important. Understanding the **Koeppen-Geiger Climate Classification, Introduction to the U.S. DOE Building Energy Codes Program and IEEC Climate Zones**.
b) **Vernacular 'Zero-Energy' Designs:** Examples of traditional dwellings in hot-humid, hot-arid, moderate-cold climates.
c) **Advanced modern enclosure systems:** Elements, functionality, strategies, materials and limitations. R-/U-values, vapor retarders, air infiltration barriers, glazing types, framing technology. Enclosure layer organization according to climate locations.
d) Introduction to thermal-hygric building enclosure analysis software **WUFI Pro®.**

Seminar requirements include a C**ase study analysis** and a WUFI® Pro Hygric and Thermal Simulation Exercise (Software will be available free of charge for a limited time period, or physically in the Architecture Computer Laboratory, 3rd Floor, Architecture building.