

Time and Place: Th 2.00-4.50p, 102A Architecture
3 credit hours
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ARCH 576CLI CLIMATE RESPONSIVE BUILDING SKINS (3 Credits) Graduate Students

Professor Ralph Hammann

Overview

The course introduces sustainable concepts for building enclosure design with an emphasis on the large-scale residential, commercial or mixed-use building in various climate regions and typically urban settings. We will learn from various 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 glazing efficiencies, such as U-, g-value, and solar heat gain coefficients. Enclosure elements which are capable of serving dual or multiple purposes (“Performance Integration”), such as enclosure and energy generation from solar thermal and solar electrical sources will be discussed. Building Integrated Photovoltaic Systems (BIPV), solar reflector concentrators, evacuated solar tubing, and other cutting edge enclosure technology will be introduced.

The format of the weekly course alternates student case study presentations and class discussions with lectures by the instructor.

Objectives and Outcome

Students participating in the seminar will learn of the significant importance of a building’s enclosure system for the overall performance of the building. Students are encouraged to familiarize themselves with the emerging concept of “Building-As-Power Plant” and its implications for the outside envelope.

Students are required to analyze one chosen building enclosure system of a modern building in regards to glazing, shading, glare protection, ventilation, infiltration and present the findings in a PowerPoint or pdf. presentation in class, perform a THERM® Façade Energy Analysis, or use Revit and ECOTECT for an energy analysis of a chosen building envelope. (Individual project).

Text

The required textbook for this seminar course is: (available through the UIUC bookstore, local bookstores, or amazon.com):

- “PlusMinus 20°/40°Latitude: Sustainable Building Design in Tropical and Sub-Tropical Regions”. D.U. Hindrichs, K. Daniels (Eds.), Hammann, R., Edition Menges 2007, ISBN 978-3-930698-83-7.