

Architecture 535 "Case Studies in Building Environmental Technology"

Credit Hours: 3 (Seminar) - The first day of class is Tuesday, Jan 16th and through Apr 23rd
Time: 8:30 - 11:30 A.M. Tuesday, including the Workshops' time.
Class: In-person, Art & Arch. Bldg. Room 2204. MIDEN – UM-VR Lab.
Laboratories: BT Computer Lab., Rm 2119, Zoom Office Hours, Tue/Th: 11:30-1:00 PM
Instructor: Mojtaba Navvab, Ph.D., FIES, Email: moji@umich.edu
Pre-requisite: Graduate standing or permission of instructor

Description:

In this course, several buildings are studied regarding building environmental control systems' influence on occupants' comfort. The course participants will evaluate selected awarded design buildings' envelopes for their environmental control systems and high-performance design. Basic sizing of the building systems is performed. Other areas of interest include case studies on building automation, data collection, and controls for building operations for various building types. Energy, daylighting, lighting, and acoustic performance analysis are performed for selected building types. Participants can develop their own building design under a given climatic condition and work as an individual or team study.

Objectives:

- 1) To understand environmental technology design techniques through case studies.
- 2) To evaluate building system design and its compliance with building standards.

Methodology:

A case study is a research methodology. Case studies are often used in exploratory research. They can help us generate new ideas (other methods might test that). They are an essential way of illustrating theories and in this course can help to show how different aspects of a building technology are related to each design objective, See possible examples: <https://xr.engin.umich.edu/architecture-lighting-miden/>

Seminar Topics

Environmentally responsive site planning	ASHRAE Standards application and compliance
Environmentally preferable materials and products	Renewable energy
High-performance HVAC	Superior indoor air quality
High-Performance electric lighting and daylighting	Acoustic, thermal, and visual comfort
Influence of climate change on occupants' comfort	Water efficiency
LEED application and compliance	Building commissioning

Recommended Book:

Mechanical and Electrical Equipment for Buildings, Stein, B., Etl, 1992, (ISBN-0-47186937-6)

