It’s the Architecture - Building Shapes and Skins for Daylighting: Connecting Sustainable Theory to Practice

“Today the majority of us work and spend most of our time in buildings, where the proper handling of daylight and the provision of electric lighting are ‘sine qua non’. Until the late 19th century life for most people was geared to the daily period of daylight between sunup and sundown. ...The industrial revolution changed all of that. It created both the necessity and the means for a new order of electrical illumination. It became necessary not only to light up the nighttime but also to provide controlled illumination for the close and precise vision to which we are now adapted.”

“The Control of the Luminous Environment”
James Marston Fitch; Scientific American; 1968

Abstract:
Daylighting design is the catalyst to applied research in architecture and allied disciplines. It is “an access point for a larger energy-conscious design market transformation” that can leverage carbon neutrality by design. Rather than relying on component technologies, daylighting is shaped and delivered by the architecture itself. This seminar will explore a number of issues that surround the discussion of the appropriate application of daylighting technology in commercial and institutional building types. It will provide an understanding of how to shape the building and design the skin for daylighting through an integrative design approach.

Objectives:
The primary objective of this course is to introduce the contemporary theory, methods and design applications of daylighting and electrical lighting integration as key elements in sustainable architectural design. This course will develop an awareness of:

- The impact and design limits that the architectural system of daylight enclosure have on lighting and energy performance, and on the attainment of sustained environmental quality.
- The contemporary tools, analytic methods and digital media used in the simulation, evaluation and prediction of luminous and thermal performance.

Methods:
Case study and analysis methods (Physical modeling and computational assessment) will be introduced as an exploration into the use of light in space and provide a vehicle of design synthesis acting as a catalyst to further design exploration and laboratory exercises.

Required Reference:
- IES-LM83-12 Daylighting Design Metrics
- Millet, M; Light Revealing Architecture; Van Nostrand Reinhold, Inc.; 1996.

Recommended, Referenced Text and Reading:
- Lam, William M.C.; Perception and Lighting as Form Givers for Architecture, 1968.
- Fitch, J. M.; American Building - The Environmental Forces that Shape It; 2nd Ed 1999.

Prerequisite: Arch 4302/ 5302 Environmental Principles or consent of instructor