instructor
Ihab Elzeyadi, Ph.D., FEIA
Professor of Architecture
370 Lawrence Hall
Ph. 541-346-3670
Fax 541-346-3626
ihab@uoregon.edu

meetings:
Tues. & Thurs.
12:00-13:50, LA 206

crn:
410: 17373
510: 17377

readings:
reading packet
+ IES_VE software
+ Arduino sensors & motor kit

credits:
4cr. hr

grading:
graded or P/N

format:
seminar with illustrated lectures and lab focusing on simulation, programing, and analysis of dynamic facade prototypes. The seminar is devoted to design and testing of high performance dynamic facades using state-of-the-art simulation packages and physical prototypes.

prerequisites:
- Arch 4/592, or prof. permission

course objectives:
this seminar explores the theory and methods behind the making of high-performance dynamic façades (HDF) and their performance evaluation. It will introduce participants to tools and techniques of activated/dynamic facades through design, testing, simulations, semor coding, and construction of prototypes. The seminar will use a hands-on learning approach engaging students in an on-going envelope retrofit project of a LEED v.4.2 all-glass building. The seminar will mainly focus on solar control, natural ventilation micro flows, daylighting harvesting, thermal and visual comfort, as well as indoor air quality related to activated skin buildings.

Much attention is given to the aesthetic and materiality of high performance facades but less on the process of their conception or their performance potential. Innovations in facade tectonics are of growing interest, however, less discussions are centered on the theoretical grounds that guide their application or rigorous evaluation investigating their actual environmental dynamics. The objective of this seminar is to critically investigate high performance facades and develop ideas and prototypes for active and dynamic building skins that has the capability to change according to thermal, optical, and occupants needs. Instead of viewing the facade as a static element, we will investigate how to employ it as a dynamic architectural apparatus to manage, daylighting, shading, views, transparency, ventilation, structure, materiality, and architectural expression. This seminar will develop ideas and prototypes for re-skinning existing all-glass buildings through a series of design investigations leading to the construction of mock-ups that will be tested on the Facade Integrated Technologies (FIT) testing facility.

Background Photo: 2CH2 - City Hall Melbourne, 2, Mick Pearce Architects