

Number & Title of Course: ARCH 207 Environmental Control Systems 1 (lecture component).

Course Description: Theory and application of climate, energy use and thermal comfort as determinants of architectural form in envelope load dominated buildings. Emphasis on sustainable architectural methods of ventilating, cooling, heating, and daylighting. 2 lectures, 2 activities.

Program Goals & Course Outcomes

- Understand the technical aspects of architectural design, building systems, and construction materials, considering the environmental impact of such decisions.
 - Ability to demonstrate the principles of environmental systems design, how design criteria can vary by geographic region, and the tools used for performance assessment (B6).
 - Understanding the selection and application of building envelope systems (B7).
- Make reasonable decisions based on an architectural understanding of ethics, diversity, and sustainability.
 - Understand sustainable principles through the study of energy flows, materials, assemblies, forms, climate, and site (SLO 1).
 - Explain how natural, economic, and social systems interact to foster or prevent sustainability (SLO 2).

Student Performance Criteria Addressed

B6 Environmental Systems

B7 Building Envelope Systems and Assemblies

Topical Outline

Climate and thermal comfort (16%)

Heat transfer and envelope performance (14%)

Solar geometry and shading (14%)

Passive heating and cooling (14%)

Daylighting (14%)

Energy modeling (7%)

Energy generation (7%)

Storm water management (14%)

Prerequisites: ARCH 242. Concurrent with ARCH 253.

Textbooks/Learning Resources:

Kwok, Alison, and Walter Grondzik. *The Green Studio Handbook*. Burlington MA: Architectural Press, 2011.

Lechner, Norbert. *Heating, Cooling, Lighting*. New York: Wiley, 2015.

Offered: Spring annually.

Faculty Assigned: Meredith Sattler (Assistant Professor), Carmen Trudell (Assistant Professor), and Stacey White (Lecturer).