ARCH 491/591 ENVIRONMENTAL CONTROL SYSTEMS I

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Meeting Time: 4:00 – 6:00 PM, Tuesdays and Thursdays  
Location: Portland Campus, White Stag Building  
Credit: Four Credits  
Grading: Pass/No Pass or Graded

Overview:  
This course, the first of a two-part series on environmental control systems, focuses on climate control systems for buildings, including both passive (architectural) as well as active (mechanical & electrical) solutions to provide thermal comfort and indoor air quality. These systems have substantial impact on construction and life-cycle costs, space allocation, building performance, as well as occupant health, comfort and productivity across all building types, and can be a major determinant in owner and occupant satisfaction with a building. This course is intended to provide a basic understanding of climate control systems that will enable you both to actively participate in decision-making related to these systems, and to integrate these systems into the design of the building.

Topics Covered Include:
- Climate and Comfort  
- Solar Geometry  
- Heat Transfer Basics  
- Ventilation & Indoor Air Quality  
- Passive and Active Heating/Cooling strategies  
- HVAC System Types  
- Vertical Transportation (elevators and escalators)  
- Energy & Economic Analysis

Format:
- Seminar/Lecture format supplemented with readings and site visits to Portland buildings  
- Homework assignments, quizzes & final project

Required Text:  

Supplemental Texts:
- Sun Wind and Light: Architectural Design Strategies by G.Z Brown and Mark DeKay  
- The Green Studio Handbook by Alison Kwok and Walter Grondzik  
- Thermal Delight in Architecture by Lisa Heschong