Hiran Patel Architects Sketchbook, Ahmedabad, Gujarat, India
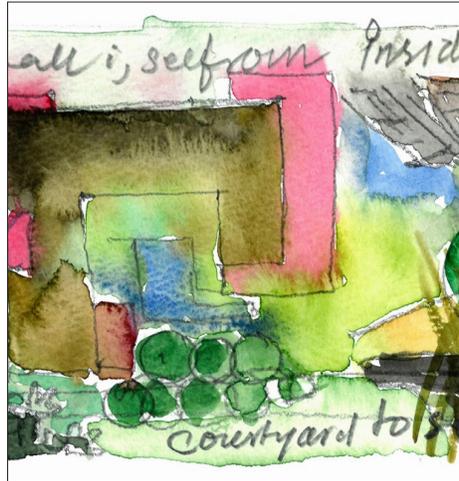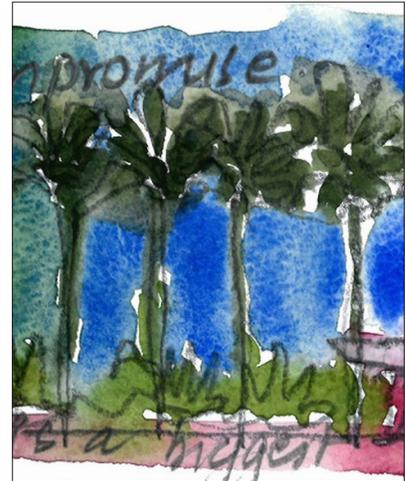

expansive shading

airy outdoor rooms

evapotranspiration

Passive Cooling Seminar

ARCH/ENVS 493M/593M
Spring 2019
Tues Thurs 10:00-11:50AM
4 Credits

Prerequisites:
ARCH 491/591 or
instructor's permission

Instructor:
Prof. Alexandra Rempel, ENVS
arempel@uoregon.edu

Materials:
- *Mech. & Elec. Equipment for Buildings*, 12
- Readings provided online
- Field instruments available for check-out

Air conditioning adoption is increasing worldwide at the fastest rate in history. Fewer than 10% of new buildings in the U.S. are built without air-conditioning, even in climates regarded as cool, and about 6% of U.S. carbon emissions are devoted to the space cooling of buildings alone. In response, the Intergovernmental Panel on Climate Change has recently called not for increased efficiency of, but *avoidance* of, mechanical heating and cooling in buildings to the greatest extent possible. Passive cooling strategies address this need directly, using building shape, internal openings, and program organization in combination with cool night air, cool night skies, earth and other massive materials, evaporation of water, evapotranspiration and shading by trees and vines, and diverse shading materials and configurations to diminish unwanted heat gain into buildings and to remove excess heat that does accumulate. In this course, you'll learn to design natural ventilation systems and estimate the heat they can remove; to design operable shading that minimizes solar heat gain during warm seasons while allowing it to offset heating needs during cooler ones; to estimate the cooling ability of evaporation in a given climate, as well as radiation to cool night skies; to design thermal mass for cooling and to reconcile that design with passive solar heating needs; and to use the adaptive comfort zone when applicable to provide guidance toward acceptable indoor conditions. This course participates in the Sustainable City Year Program.

Please contact the instructor with any questions: arempel@uoregon.edu.