University fo Oregon - School of Architecture and Allied Arts - Department of Architecture
ARCH 407-507 Winter 2016 Wed 10:00am-11:50am in 405A LA, Friday in 283M LA

Professor Nancy Y Cheng, nywc@uoregon.edu, 541-346-3674 o, 541-556-4590 c
Office hours M 10:45am-12:45pm in 477c or Skype (ncheng1)
Teaching assistant Sam Clagett, sclaget5@uoregon.edu **http://blogs.uoregon.edu/bioform**

Form and Performance 1:
Natural Models for Environmental Fitness

SYLLABUS

Biomimicry Design Cycle by the Biomimicry Institute
http://www.biomimicryinstitute.org/about-us/biomimicry-a-tool-for-innovation.html

Purpose: This course examines how biomimicry and parametric design can address environmental challenges.

Plants and animals thrive in their habitats because they have structures, mechanisms and systems that work efficiently in specific environmental conditions. This class will examine how natural organisms can be models for architectural design using Biomimicry 3.8 principles and morphogenetic parametric design. Starting from the beauty of nature as inspiration, students will study ways that architects and designers are examining nature's forms, mechanisms and systems to discover principles for approaching design problems. Design approaches will include processes of observation, description, analysis, metaphor and abstraction.

Biomimicry and systems thinking will provide a framework for looking at skins, growth and bones as paradigms for designing static structures and dynamic systems. Students will study how designers have used natural models to generate architectural systems and kinetic constructions. Examples will include landscapes, architecture and product design.

The course develops understanding of concepts through readings, lectures and discussions, then fosters applied skills through design-oriented homework assignments. To develop flexible formal ideas, students will articulate geometric relationships with Rhinoceros-Grasshopper (GH) parametric design software. Climate visualization, solar and lighting simulation will be done using the GH Ladybug-Honeybee plug-in.

Class sessions will include presentations, discussions and hands-on activities. Successful completion of this course will count towards the advanced technology requirement.

Pre-requisites: ARCH 4/571 & 4/572, 384 or permision of the instructor
Students do not need to bring a scientific knowledge, instead students are invited to investigate how organisms thrive in their environments, to grapple with understanding key biological, physical or chemical processes that underlie observed phenomena.