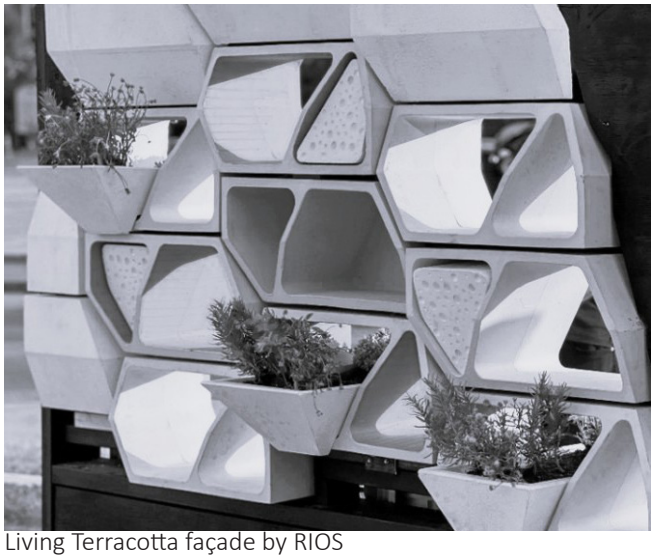
Multispecies Design: Building Envelopes as Ecological Infrastructures + Architecture After the Algorithm

ARCH 571 | Design: Detail and Architectonics | M/W 1:00 to 5:50
ARCH 593 | Special Problems in Detail and Fabrication | Thu 2:00 to 4:50

Instructor: Niloufar Emami | Assistant Professor | nemami@illinois.edu

Pigeon tower



Living Terracotta façade by RIOS

Swift brick

Course Overview

This research-design studio explores the intersection of multispecies design, building envelopes, and additive manufacturing. It asks how envelopes can move beyond sustainability—minimizing harm—toward a regenerative system that actively enhances the ecological systems a project touches, shifting the conversation from harm reduction to habitat reintegration. Where transparent envelopes pose a problem of collision to be prevented, opaque masonry envelopes present a different and more generative opportunity: rather than merely reducing harm, the mass wall can be reprogrammed as active habitat substrate.

The design object of this studio is a custom-cast habitat module that mates with standard concrete masonry units rather than a redesign of the block itself. This is a deliberate strategy. The load-bearing, code-rated masonry system remains standard and unmodified; the custom, non-structural module carries the nest cavity, entrance, perch, and surface texture, presenting habitat to the exterior face while leaving the wall's structure and manufacture untouched. Because the module mates with ordinary units, it can be specified into new construction and retrofit into existing masonry stock—extending the regenerative claim from new buildings to the vast inventory of inert walls already standing.

The first part of the studio pairs bird-species research with the iterative design, molding, casting, and prototyping of these habitat modules, developing the mating geometry between module and standard unit as its central problem. The remaining part of the studio focuses on the design development of a performance center, as framed by the 2027 Concrete Masonry Design Student Competition (ACSA), scaling the module from a single unit into a façade field across the building envelope.

-Fabrication

Casting concrete into 3D-printed molds is the studio's primary fabrication technique. 3D printing costs and most material costs are covered through the generous support of the Illinois School of Architecture.

-Prerequisite

The studio and seminar are packaged and complementary. Studets who are enrolled in the studio will be asked to enroll in the seminar. Please check the meeting days of the seminar for any potential conflicts. The seminar focuses on exploring computational and parametric design tools, understanding the leading figures in the computational design field, and having in class discussions about readings.

Any Questions? email me at nemami@illinois.edu