Computed Geometry

ARCH 593 | Special Problems in Detail and Fabrication | 3 CH

Illinois School of Architecture | Fall 2025 | F 1:00 PM to 3:50 PM | online
Instructor: Niloufar Emami | Assistant Professor | nemami@illinois.edu | 216 TBH
Office hours: contact instructor to set up a time.

3Dprinted steel bridge in Amsterdam, by Van Wijnen and Max3D.

Course overview

"We shape our tools, and thereafter our tools shape us."

As computational design technologies—such as Computer-Aided Design (CAD), parametric modeling, and simulation tools—advance, they are transforming architectural design. These tools not only influence the forms we create but also reshape the way architects think and design. The focus of design thinking is increasingly shifting from "designing the outcome" to "designing and defining relationships between design components," fostering an iterative computational practice.

Interdisciplinary and simulation-based design approaches increasingly depend on computational workflows. In this course, students will explore computational geometry and geometric principles for creating complex freeform surfaces, with a specific emphasis on geometries suited for precast construction.

The course includes weekly assignments in computational design and simulation, as well as readings on computation, materials, and digital fabrication. It is primarily designed to support the digital fabrication-focused graduate studio. Priority enrollment is given to students in the studio; remaining seats will be available to other interested students.