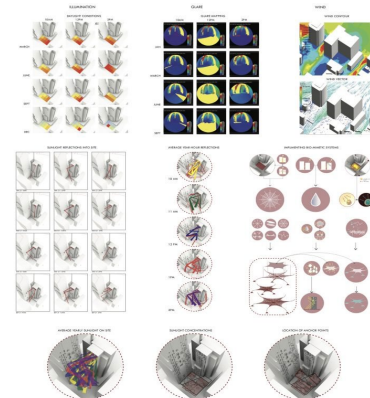
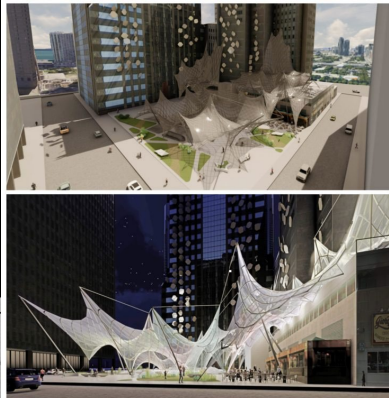
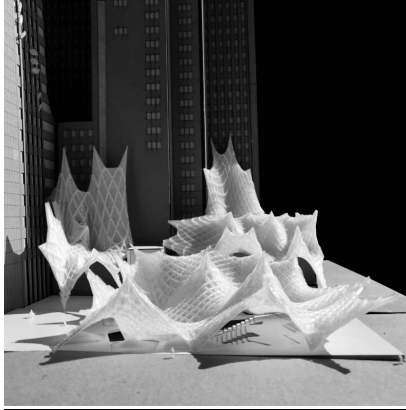


ARCH  
573  
2021FA

# High Performance + Responsive Architecture

FALL 2021  
Rev 01-22-2021



Credit: Ananthanarayanan, Sanders, Ganguli

## **Course Overview**

Our deeper understanding of sustainability and ecology has led to a performance driven architecture that focus more on energy efficiency than design. However, one of the biggest misconceptions of high-performance building is the belief that saving energy is the premier focus, when it should be to cater for the comfort and well-fare of our focus: the occupants. The core concept of sustainable, or high-performance, building is that it is being designed and oriented for the comfort of the occupants.

Responsive architecture aims to optimally responds to a range of needs within multiple contexts that it is capable of self-modification, regulation, and adaptation. By reacting intelligently to changes of various kinds, architecture can be high-performance building.

The studio emphasizes that buildings are never inert, static but buildings should be dynamic and respond to the environment in where they are located. Buildings can be more symbiotically designed with the information from surround environment.

This studio will be accomplishing this by focusing on three environmental factors: Thermal, Light, and Airflow. These three factors will be the basis to shape building design into becoming high-performance design buildings.

Students will be introduced to design metrics via the latest building simulation tools used in the profession to evaluate the environmental impact of design choice. ClimateStudio, Eddy3d, Galapagos are some of the tools that will be used during the studio to evaluate the performance of the design.

The project is to design an **Extension of Museum of Contemporary Art Chicago (MCA)** located at 220 E Chicago Ave, Chicago, IL 60611.

## **Prerequisite skills and foundational knowledge**

- The studio requires to have a skill and knowledge to design a multi-purpose building.

- The studio requires to have a fundamental knowledge on the environmental and sustainable design.
- The studio requires to have a basic skill or willingness to use parametric design tool such as Grasshopper and Rhino.
- The studio requires to have a basic skill or willingness to use computational simulation tools such as ClimateStudio, Eddy3d, energy simulation tools.

**\*\*The class will heavily depend on using Grasshopper for parametric design. It is strongly recommended to have an at least basic skill of Grasshopper before taking this studio. Please contact instructor for more detail information.**

### **Course Goals and Objectives:**

- To learn how to research and gather information, both factual and speculative.
- To understand the sustainable / high performance architecture.
- Able to apply and evaluate a building performance with using simulation tools.
- Able to design (create) a building that use parametric design method.
- To analyze precedent examples of architecture and representation to better understand how to convey ideas through technique and craft
- To develop rigorous work habits and time-management skills

### **Grading:**

There will be 8 modules and 7 workshops, each module and workshop will be graded. Student participation will be considered throughout the semester. Also, mid and final presentation will be graded. The percentages for each component are listed below:

1. Modules / workshop assignments	40 points
2. Participation and attendance	15 points
3. Mid review presentation	15 points
4. Final presentation	30 points
TOTAL	100 points

Grades will be awarded based on the University standard for grade application. Letter grades are as follows and may be "fine-tuned" as appropriate (process grade) with the addition of plus (+) or minus (-) as indicated.

\* The five basic letter grades are as follows:

(A = 93-100 points) (A- = 90-92 points) (B+ = 87-89 points) (B = 83-86 points) (B- = 80-82 points) (C+ = 77-79 points) (C = 73-76 points) (C- = 70-72 points) (D+ = 67-69 points) (D = 63-66 points) (D- = 60-62 points)

F = Unacceptable work, incomplete or missing work, shows lack of interest or motivation in meeting goals, fails to meet minimum standards and or deadlines (below 60 points)