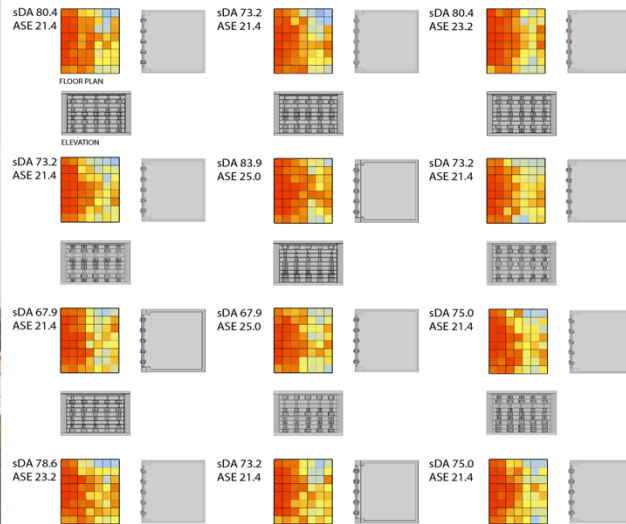# Performance-based Parametric Design
Fall 2023

Left: Edificio San Francisco, photo by Lauro Rocha. Right: Evaluating the daylight performance of a masonry screen wall.

Instructor: Elena Vazquez (e.vazquez@uncc.edu)
Class: Tuesdays 11:30-2:00 pm
Office Hours: by appointment

COURSE DESCRIPTION

Parametric design is widely used in contemporary architecture and design practice. This course will explore the techniques and tools used in parametric modelling, with the aim of developing a performance-based approach to design. We will use Grasshopper for Rhino –a visual scripting language- to construct computational design workflows, to generate, evaluate, and optimize design solutions.

The course will be divided into 3 modules and a final project, covering the following subjects:

• Parametric modelling with grasshopper. How to rapidly generate design alternatives for design exploration.

• Parametric modelling and environmental performance: How to evaluate and rank designs according to environmental performance metrics.

• Optimization: How to use optimization algorithms for design space exploration based on performance.

Students will develop a computational approach to problem-solving in architecture and learn how to use parametric and performance-based design in the context of architecture practice and research. They will also implement strategies for evaluating the performance of design solutions. The final project will allow students the opportunity to develop an in-depth exploration of a particular design issue of their choosing. The class will consist of a series of 3 modules, each one of them starting with a lecture, followed by a workshop and an individual assignment.

COURSE GOALS

By the end of this course, students will be able:

1. To construct computational design workflows in the generation, evaluation, optimization of design solutions.
2. To evaluate the efficiency of design solutions in terms of various performance metrics such as daylight, energy consumption, acoustics, and so on.
3. To develop computational frameworks for problem solving in architecture based on performance.