Carnegie Mellon University

School of Architecture
College of Fine Arts, CFA 201
Carnegie Mellon University
Pittsburgh, PA 15213

Guastavino stair in Baker Hall at CMU (Pittsburgh History and Landmarks Foundation)

48-638: An Exploration of Structures
Units: 9
Instructor: Jeffie Chang

Understanding the principles of physics in building design is essential for architects. We will begin with focusing on statics and mechanics: rigid body static equilibrium, free body diagrams, and statically determinate structures. These fundamentals are crucial in understanding how more complicated structures behave.

Once we have covered statics and mechanics, we will turn our attention to load paths and structural systems for the remainder of the class. In structural design of buildings, the most important concept is load path: tracking the applied loads through the structural elements down into the foundation. Stability cannot be achieved without a clear load path. This course will cover load takedowns, gravity systems, lateral systems, and the major building materials: steel, concrete, masonry, and wood. Throughout the course, we will study the intersection between architecture and structures. Emphasis will be placed on both global behavior of various structural systems and local effects of individual structural elements. Students will be evaluated based on a combination of homework assignments and project work.