In past ages, the construction of buildings was an integrated activity in which aesthetics, planning, structure, and construction were all considered to be part of a single unified activity. In some cases, buildings were constructed under the direction of a single master builder who was an expert in all these areas. In other cases, they were built by the people themselves—their culture having evolved to a level that the entire population understood the qualities and capabilities of the materials used to make buildings. The outcomes of such traditions were buildings in which there was an elegant, and sometimes profound, integration of structure, space and construction. Structural members not only held up the roof: they shaped space, conveyed feeling, and connected with people.

Today, the construction of buildings follows a much more fragmented process in which specialists are responsible for discrete parts of the overall activity. The entire team may include architects, numerous engineers, specialist consultants, project managers, a general contractor and many subcontractors. It is naturally the contractors—the people who touch the materials and build the buildings—who have the most complete understanding of how the materials go together from a practical point of view, and the engineers—those who study the structural capabilities of the materials and calculate the strength of members and connections—who have the most complete understanding of how the building behaves from a structural point of view. Architects, if removed from these fundamental concerns (both in school and in practice), will have little chance to create buildings that have an essential and meaningful integration of structure and space.

This course is a continuation of the two-term sequence which began with Structural Behavior (ARCH 461/561) in the Fall term.

As an architect, you have the legal responsibility to oversee all areas of a building project, but in order to effectively integrate construction and engineering with your designs, you must have real control over the way a building is built, both during the process of design and during the process of construction. In order to have this control, there are two principal areas of knowledge that are required: first, you need to understand materials and how buildings are put together, and second, you need to understand how buildings behave structurally.

Our goal in this course is to continue to develop your understanding in these two general areas, aiming to enable you to use structure as a creative force throughout all phases of design. Major topics will include mechanics and strength of materials, structural design in steel, concrete and wood, structural planning, and seismic design.