

ARCHITECTURE 461/561  
**Structural Behavior**

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.

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 begin to develop your understanding in these two general areas, aiming to enable you to use structure as a creative design force throughout all phases of design. Major topics will include a general examination of how structure and construction play an essential role in building design; reviews of exemplary case studies; discussion of an integrated design process; detailed study of the behavior of structures; and structural analysis.

CRN: 461: 10485  
561: 10565

Instructor: Stephen Duff and Mark Donofrio

Lectures: MWF 10:00 -11:50 177 Lawrence Hall  
Friday lectures may be devoted to normal lectures, project reviews, help sessions, or quizzes. This will be decided on a week-by-week basis, and students will be informed of each Friday's agenda no later than the preceding Wednesday's class.

Labs: Times and CRN's as indicated on Duck Web

Credits: 4

Prerequisites: ARCH 470, PHYS 201, passing score on diagnostic exam or attendance at required modules of math and physics review course during the week before class.

Attendance: Required in lecture and labs. GTF's will be taking attendance in labs.