Architecture Studio: Foundation II / 1ˢᵗ Year Spring
Spring 2015, CMU, Arch #48-105, M/W/F 1:30-4:20
Studio Website: www.andrew.cmu.edu/course/48-105

Coordinator: Kai Gutschow
Email: gutschow@andrew.cmu.edu
Off. Hr: by appt. in MM302
(2/2/15)

Project 1: TECTONIC SYSTEMS: Span

The next phase of Proj.1 will build on accumulated lessons and expertise about folding, bending, and joining techniques, paper materials, structure, stability, and tectonic performance, movement and paths, and representation in 2D & 3D. But the goal is changing, to a large wood construction. It is a chance to continue earlier ideas, or to start over.   Be careful what you design: you will have to build it in wood.

Your charge is to design and build a full-scale, furniture-sized wood structure spanning between two supports that can carry substantial loads from above (e.g. a small person). The emphasis should be on the inventive joinery of multiple thin wood elements to achieve a stable span. The structure will be judged for structural performance and stability, and for creative and tectonic expression, both the overall span, and the detailed joinery and assembly.

Observe the following constraints and performance criteria:
 - all support piers will be standardized, a hollow box approx. 4"x8" and 16"h (exact dimensions TBA) located 48" apart
 - the joints between support boxes and span are important. They can be different at each end. They should be structurally sound, and tectonically expressive
 - the span may not touch the ground between the supports, though it may do so outside of the supports
 - the span must be a minimum of 8" wide at all points between the supports. It can be wider, and can vary along the length
 - you must fabricate the entire structure using only thin wood slats whose maximum dimension is 2-5/8"x7/8"x24". Note that this is substantially shorter and narrower than the required span and width, requiring you to join and extend the slats
 - the wood elements can be cut and bent in any way you wish. Where appropriate you can use pre-made pieces smaller than the slats, such as dowels
 - minimize your use of glue. Use glue only to join thin slats in the longitudinal direction to help create more rigid, "folded" elements. Avoid "cross-grain" gluing, or merely laminating slats together to increase size. Instead, join elements with pegs, splines, wood connector pieces, notches, and other inventive applications of geometry and intuitive structural thinking.
 - no metal, plastic or other fasteners are allowed
 - a primary design driver must be the strength of the structure. All final structures will be tested for load-bearing performance
 - constraints may be changed or added as the project develops in order to satisfy project/client/instructor demands and intentions

Proj.1, ASSIGNMENT 5 (due Fri. 2/6, 1:30pm)
Invent at least three substantially different support and span structures using only bond paper. You can fold, bend and connect the paper any way you like, but do NOT use any glue, tape or other fasteners.

Begin with an open mind, but attempt to follow the nature of the constraints listed above for the final project. Do research and think broadly about possible inspirations or precedents. Although the project will terminate in a furniture-sized wood construction, it may be useful to understand "span" flexibly as a "bench," OR a "shelf," OR a "beam," OR a "truss," OR a "bridge" OR any other kind of linear structure or path connecting two points.

Think abstractly also about the issues of "joinery", about the need to extend and connect shorter linear members into longer and wider spans, and about the many different ways that wood members might be joined, interlocked, or telescoped to form the span. Think of the many different ways you and your classmates folded the paper, and which techniques might best apply to these changed criteria. Test many different ideas, and invent new ones based on new constraints and new understanding of the project goals. Don't settle on one idea too quickly; keep several equally good and very different ideas going at once.