TAUT was an integrated architectural design studio and structural seminar course taught at the University of Michigan in Ann Arbor this past winter semester, 2011. The course exposed graduate students in architecture to the design history and techniques of constructing tensile fabric structures. As part of the course, students researched, designed, fabricated, and installed their own fabric structures on the grounds of Grass Lake Sanctuary. Each installation is meant to address the landscape and therapeutic program of the GLS through the construction of an inhabitable structure for one or two people. Visitors are encouraged to touch them, view the landscape through them, and take shelter in their delicate, taut walls.

Tensile Fabric Architecture Today

Fabric in architecture is a unique form of making space. It spans the gamut from the lowest technology tents constructed with simple materials and means to highly engineered buildings. While this span allows much room for the architect to design, fabric as a building material continues to be one of the less studied and under utilized materials in building construction. This deficiency is due in part to the large number of variables in the design process. Unlike more traditional building materials (brick, wood, steel) fabric is a highly variable material and the structural tensioning systems employed require intensive calculations at every joint. This makes projects with complex geometries and non-repetitive components highly complex and expensive to resolve.

Today, the expanding capabilities of digital design and fabrication have allowed a greater facility in the medium of tensile fabric architecture. The TAUT studio and seminar course sought to exploit our expanding access to computer technologies to increase the access and abilities for architects to design increasingly complex tensile structures. Students learned how to utilize multiple 3D modeling software to design, optimize, and pattern fabric forms. Simultaneously, students also shaped their designs through physical modeling and traditional 2D orthographic projection techniques. Once the design was complete, students cut and sewed their fabric patterns, mounted hardware, and installed the pieces on site.

ARCH 562 – Architectural Design 2G2/3G5 – Professor Anca Trandafirescu
ARCH 524 – Surface Structures – Professor Harry Giles

Pieces are on view throughout the summer at:
Grass Lake Sanctuary
18580 Grass Lake Road
Manchester, MI 48158
PHONE: 734-726-0290 (for viewing appointments)
http://grasslakesanctuary.org/

The Grass Lake Sanctuary will hold their annual open house entitled “Earth Connections Day” on June 25, 2011 from noon – 5:00. Grounds are open to the public.
Twins

Twins is a piece that asks viewers to consider the relationship of splitting and reunion. Situated in two halves across a small stream in a deep, wooded valley, visitors first encounter the hidden piece through parts just tall enough to be seen above the ravine. Arriving at the site, one encounters two parts, each independently oriented to its own bank and yet each dependent on the other. The viewer interacts differently with each side – with one he can get inside and underneath, the other she can’t occupy but can only see into. In order to experience the entire piece (both sides) one must momentarily move away from it and cross the divide to the other side to be reunited with the whole.

Students: Sarah Barrett Erika Lindsey

Spark

This piece emerges from the Grass Lake hilltop to act both as both a beacon to the highest point in the park and to provide a resting and viewing place for visitors who reach the top of the hill. It accommodates two people sitting “together but separately” getting unique views out into the landscape surrounding the hilltop and leading the eye to focus on the subtleties of the prairie grass nearby. The structure reacts to the unique attributes of the hilltop; the location offers direct sunlight with no cover and winds that can vary widely in both direction and magnitude. The structure creates different qualities of shade for visitors as the day progresses and sunlight changes; it also blocks strong prevailing winds while funneling gentle breezes through. We plan that as the summer progresses the prairie grass will grow higher and further enclose the structure creating an even more intimate experience within.

Students: Julia Gankin Heidi Swift
Fringe

Located at the threshold of a semi-dense forest and an open marsh near the cabin, the positioning of Fringe addresses the release of the forest into the open. Two nearly touching fabric pieces straddle and negotiate the barrier created by the swelling creek and the edge of the forest by stretching towards the ground on either side. Although the two white objects draw the viewer from far towards the installation, the void between directs the user near with a rotated view of the marsh and the horizon. The natural environment became the driving factor behind the form of the project with the earth and trees acting as the sole facilitator of support for the design. From the changing position of the swelling creek within the objects to the connection of the pure white forms to the surrounding trees, the project reframes the existing natural environment while its use varies depending on the season and the user.

Students: Justin Garrison
Kyle Hoff
Greg Perkins

(f)light

Situated in a rolling, wooded valley between two open hills, (f)light draws visitors to gaze upward while moving downward. It is constructed of a highly sheer white fabric that allows one to see through many of its layers and seemingly multiplies the number of components. Each of the twenty-seven individual pieces is made of an identical shape, but each varies in size and is stretched into its own individual form. The receding forms play with one’s perception of depth of the piece itself and the overlapping transparency increases the overall brightness in the dark site.

Students: Minghui Huang
Matt Nickel
Lauren Vasey