Stereotomy + Topological Modulations computed fabrications and optimizations

Digital logics, expressed through computational design, have exposed novel form-finding methodologies, details, and fabrication techniques. This research based studio will extensively use virtual space to create physical logics that compute modulated architectures.

Course Requirements

The course will require a working knowledge of Rhinoceros, as well as a basic understanding of Grasshopper plugins [weaverbird & kangaroo] as well as SAP2000 [instruction in these programs will be administered throughout the semester]. The course will focus on two modes of fabrication: the computer numeric control router, to produce plywood two-part molds / fabric patterns; and deposition printing.

The Studio will be split into four parts, which are outlined below. The assignments will be completed in groups of 2; the final project will be a studio wide collaboration. All work will be part of an end-of-the-year exhibit.

All projects will require construction documentation, in form of drawings and photographs / renderings as determined by the design critic, all documentation will be complied into a text for submission throughout the semester.

Projects:

[0] 2 Weeks Concrete Mixtures 10%

The primer for the semester: In groups of two [2], students will digitally create [using Grasshopper], then, fabricate a two part mold with specified dimensions to submit 10 concrete cylinders, which will be used to study the effects of variations in concrete mixtures. These studies will be used to determine the appropriate mixtures of concrete throughout the semester.

[1] 3 Weeks Mesh Relaxation Elastic Molding 25%

In groups of two [2], students will digitally create [using Grasshopper] then fabricate an elastic mold for concrete casting within a bounding box 13,824in³. This artifact will be used to construct a narrative which responds to an ecological, infrastructural etc site-specific crisis as determined by each group.


In groups of two [2], students will digitally create [using Grasshopper] elastic fabric cast blocks 216in³ each, to form a stereometric modulated topological surface within a bounding box 21,600in³ which investigates a specific portion of project [1] and a variant of the mixtures from project [0].

[3] 2+5 Weeks K (null,+,−) Stereotomy + Topological Modulated Structures 40%

2- In groups of two [2], students will create an internal competition submission in the form of two [20x30 Boards + models], which will be evaluated by invited SoA faculty members. Two projects will be chosen and the concepts will be explored in detail at full scale.

5- In two groups, the selected projects will be detailed and fabricated using fabrication / material methodologies investigated throughout the semester.

Text Books: