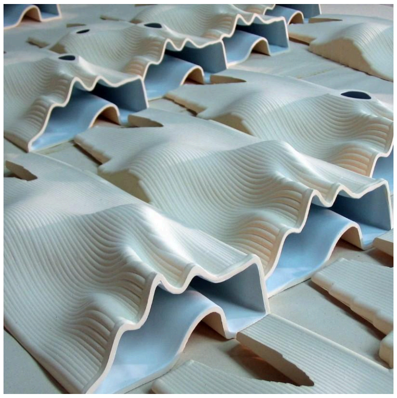

ITC: Project 1

Material Consequences

Learning Outcomes:
-balancing coordination and creative freedom
-experiment-based design development
-precedent analysis
-analytical design practices
-conceptual modeling, data modeling, physical modeling

DESCRIPTION

This project explores the intersection of ceramic design and architecture, focusing on the creation of interlocking ceramic components that aggregate to form a system. Students will delve into various ceramic fabrication techniques including clay slab building, clay extrusion, and slip casting to design and produce a series of modular components. Emphasis will be placed on understanding the principles of interlocking systems, structural integrity, and aesthetic coherence within the context of architectural design.

Throughout the project, students will engage in hands-on experimentation, prototyping, and iterative design processes. They will learn to harness the expressive potential of ceramics while considering factors such as material properties, scale, and spatial relationships. Additionally, students will explore digital tools and techniques for designing and refining their components, enhancing their understanding of contemporary design processes.

Designing through experimentation and analysis could be broken down into the following milestones.

Research and Concept Development:

- Conduct research on interlocking systems, architectural precedents, and ceramic fabrication techniques.
- Generate initial concepts and sketches exploring different approaches to interlocking ceramic components.
- Develop a clear design brief outlining the goals and parameters of the project.

Prototyping and Material Exploration:

- Experiment with clay slab building, clay extrusion, and slip casting techniques to create prototype components.
- Test different forms, textures, and surface treatments to achieve desired aesthetic and functional qualities.
- Evaluate the structural integrity and interlocking mechanisms of prototype components through physical testing.

Design Refinement and Digital Modeling:

- Translate physical prototypes into digital models using CAD (Computer-Aided Design) software.
- Iterate on design variations, exploring different configurations and assembly methods.

- Refine the digital models based on feedback and testing results, optimizing for manufacturability and performance.

Fabrication and Assembly:
- Produce a series of final ceramic components using the chosen fabrication technique(s).
- Ensure consistency in size, shape, and surface finish across all components.
- Document the fabrication process and address any challenges encountered during production.

Assembly and Presentation:
- Assemble the ceramic components into a series of larger units or spatial configurations, demonstrating their interlocking capabilities.
- Prepare a presentation showcasing the design process, technical considerations, and final proposal.
- Present the architectural proposal to the class, highlighting the innovative use of interlocking ceramic components and their potential applications in architectural design.

However, instead of leaving students to navigate through the process themselves, the course instructor will provide a sequence of tests, experiments and design inquiries to help students establish their intended focus and evolve their design intentions.

SPECIFIC

This project can be understood as a series of material experiments and the analysis of outcomes to develop a system of aggregation. From this project's outcome, the potential applications of the designed system will be considered through a series of architectural proposals.

The process for developing a system of aggregation will be preformed by a sequential investigation of (1) material manipulations to produce a family of components, (2) component to component interactions to design a building unit, and (3) unit to unit connections to design an assembly.

The following outline details the process for advancing through the three sequential investigations. Students should consider this outline as a suggested formula for progressing through the design evolution.

PROCESS

In preparation of starting the project, students will be asked to form teams of two. Each team will then choose an initial production process to focus upon. One team will investigate **profile extruding**, another team will examine **slip forming**, and the third will study **slab draping**.

MILESTONES

Initial Attempts

References**:** Organize your teams interests by finding works by artists, designers, and architects that will be used for inspiration. The found projects to be used as reference should either include the use of related production methods or present insightful opportunities for attachment ideas or aggregation logics.

Material Tests**:** Perform a series of simple tests to learn about the material's attributes and abilities, how to successfully manipulate the material. (Examples could be: part-to-part bonding, clay moisture levels needed for intended manipulation, shrinkage from clay drying and firing, texture applications, finish options like glazing,...)

Component Strategy

Primitive: The primitive should be understood as an initial material preparation. In the case of extrusion, the primitive would be the tubular or rod clay forms that emerge from the extruder. These forms would be initially designed by coming up with the profile to be extruded. The slab draping primitive would be the initial form produced by draping a sheet of clay over a form. As for slip casting, it would be the initial hollow-body form that will be further manipulated after coming out of the slip mold.

Primitive To Component: The P-C is the method of transforming a primitive into an component. This is achieved by performing a simple manipulation to the primitive. An example might be, bending an extruded tube to take on a specific curve. Another may be making deliberate cuts or creases into the primitive.

Component Family: The component family will be a group of forms that can be made from slight differences in the P-C manipulation. In other words, a catalog of components that can made from the P-C manipulation. In the example of the extruded tube, a family of components could be a group of 4-10 bent tubes that differ only in the angle in which they are bent.

Unit Strategy

Component To Component Attachment: Once a catalog of differing single components is established, how will one attach to an adjacent component(s). Continuing the bent extruded tube example, the C-C attachment could be how the components interlock.

Component Cluster To Unit: Now having established a family of components and how they are connected to others, how does multiple components interlock or become bonded together to become a unit. A unit should be understood as a sub-assembly of components that are attached together to become a sort of chunk or cluster that will some be aggregated together to become something spatial, like a wall or column.

Unit Family: In a similar process to coming up with a Component

Family, the Unit Family is a catalog of clusters made from disparate arrangements of the components.

Arrangement Methods

Unit To Unit Connection: U-U Connection design development will work similar to how we came up with the C-C Attachment. Not to say that Units will connect in the same way as the Components but, a method of bringing multiple differing units together. This could be through interlocking or even something as simple as stacking.

Aggregation Study: Once U-U connection is figured out, a system of aggregation has ben designed. The Aggregation Study will attempt to put the system to work by setting up a scenario to test it's ability to function. For example, how might a small collection of units chosen from the Unit Family attach together to become a simple architectural form. Such as a wall, column or arch.

Implementation

Application Proposal: Although an architectural use proposal is what will make up Project 2. The final step in developing P-1 is to propose the student's intentions for P-2.

DELIVERABLES

Both the schedule for carrying out the above process and the required deliverables will be provided at the start of each milestone. So look to each milestone prompt provided by the instructor to ensure that your team is on schedule and the necessary diagrams, photos, tests and prototypes to be produced.

NOTES

The milestones listed above will be addressed in sequence, however due to our understanding of the non-linear progression of the design practice, students must assume that adjustments to their design may extend the recursive nature of our work.

Each of the milestones will be introduced in a similar manner to our past assignments but with a glimpse into where our work will be heading should prove to aid in the project's progression.

END