

From DCA conference paper **Opposites Attract**

Visual Arts

Course information for 2D and 3D Design

Introduction to 2D and 3D Design meets once a week for two hours and 45 minutes. The course is comprised of lecture, critique and art-making time in a studio classroom for 20 students in the New Media Arts Degree Program. The course provides introductory study in the foundations of art placing emphasis on composition, investigation and analysis of space and spatial relationships, and use of space and form as a communicative material. Assignments develop spatial thinking across dimensions. Students use multimodal exploration to engage in creative and critical thinking to solve problems in 2D and 3D designs and to communicate effectively.

Foundations of Art courses introduce students to the basics of art—Elements of Art and Principles of Design—that help them establish the composition and create the design. Instructors incorporate these fundamentals in relation to the primary focus and objectives of the course and specific assignments. To achieve course objectives, assignments incorporate experiential learning and use a range of mediums and materials to investigate spatial perspectives. Instructor guided practice facilitates critical thinking and problem solving merging traditional and contemporary approaches to learning, instruction, and pedagogy.

2D and 3D Design Assignments

From 3D to 2D via 3D Scanning Assignment: This assignment introduces 3D Scanning and 3D Printing technologies and challenges students to address how to use these traditional engineering methods for visual art. The assignment progresses from hands-on tactile manipulation of clay to computer-generated 2D imagery traversing analog and digital formats. Students explore spatial relationships between 2D and 3D in unconventional ways and use the 3D scanner to create digital images that they transform into new visual artworks. The multistage, multi-week assignment takes place in the studio, in the KSU Center for Additive Manufacturing Engineering Lab (CAM), and the homework location of the student's choice.

The process begins with the ideation and rendering phase in the studio. Students manipulate small pieces of modeling clay and draw traditional thumbnail sketches suggesting mass. A dark color, non-drying oil-based clay is modeled into a simple three-inch sculptural form. Students move to the CAM Lab to scan the clay maquette and save the scan as an STL file. Students analyze and rotate the scans using the scanner manufacturer's software. The STL file may also be exported and manipulated in other software. Manipulations to original scan images include the following: rotation, colors, layering, size and scale adjustments to create significant virtual illusions of 3D space. Students design a minimum of five variations and bring them to class for in-process critique. Students conduct final alterations and modifications for dynamic, interesting compositions and print 14-inch x 17-inch color posters for final critique.

Irregular scans may work for the 2D image, and actually may be more interesting. However, for the 3D Printing process the scan must be refined by cleaning up the file to eliminate any voids. Photoshop has the capacity to send files directly to 3D printers. A project extension includes 3D Printing in the CAM Lab from the scan of the original clay form to complete a 3D-2D-3D circle.

The assignment requires these final deliverables: Digital Artwork Poster, Written Reflection, and PowerPoint documenting the process. The writing component records the student's generative ideas, conceptual idea, artwork title and artist statement and includes visuals documenting the process. In order to place a greater emphasis on the design phase, students identify ways they use thumbnail sketches and digital techniques to aid in the development of final pieces.

Fig 4. From 3D to 2D via 3D Scanning—Student process (Thumbnails, Modeled Clay, Scans, Digital Artwork).

From DCA conference paper **Opposites Attract**

Visual Arts

Course information for 2D and 3D Design

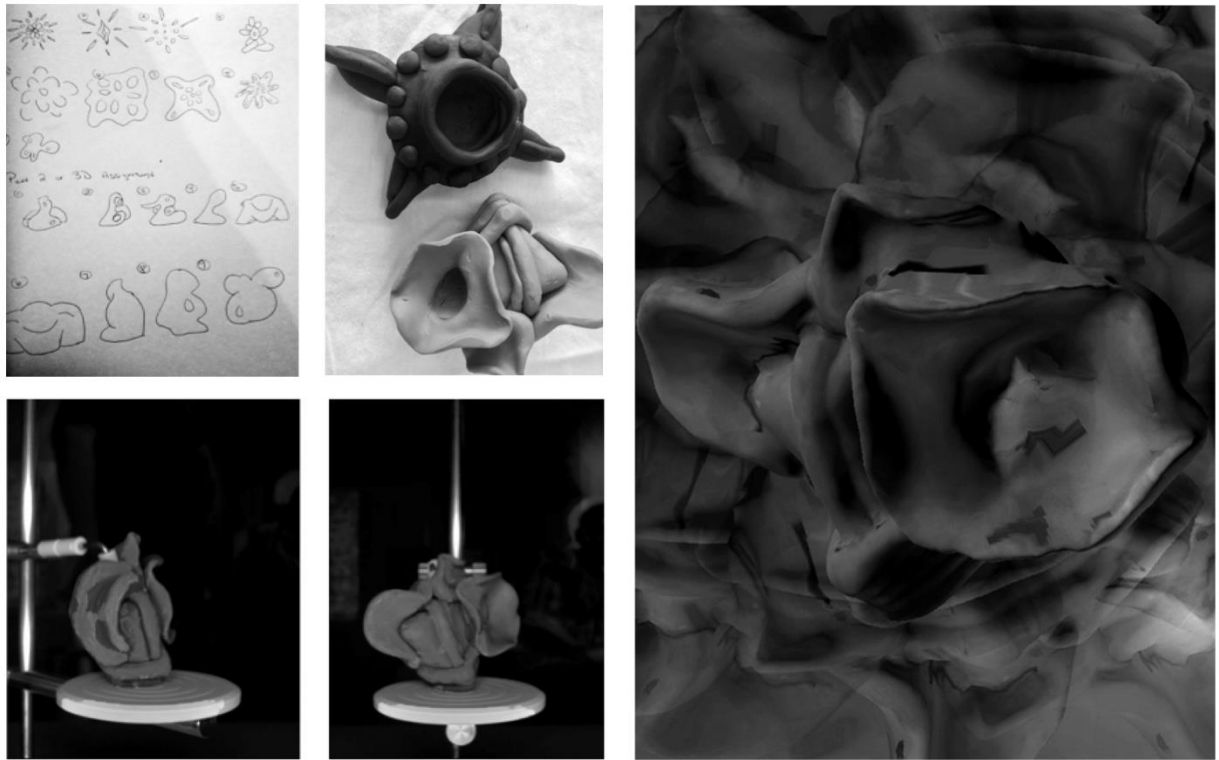
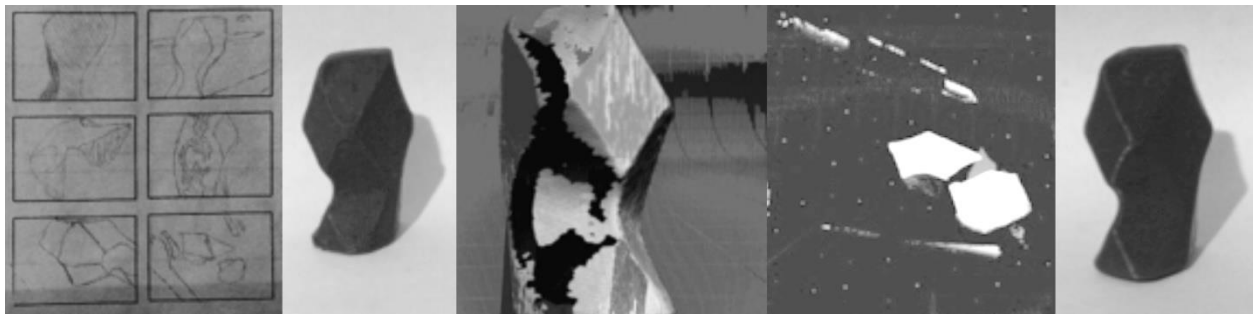


Fig 5. 3D Scanning to 3D Printing—Student process (Thumbnails, Modeled Clay, Digital Artworks, 3D Printing).



From DCA conference paper Opposites Attract

Visual Arts

Course information for 2D and 3D Design

Final Project: 2D, 3D, New Media Arts Assignment: This final project reinforces learning objectives for the course: to work through creative ideas; to formulate solutions to communication problems, to form an understanding of the thought process and development of visual analyses, to explore and utilize varied approaches to communication through 2D and 3D abstracted forms, and to develop new ways of thinking about design and creative processes.