Prototyping
Overview

“Prototypes evolve along with the design process; simple prototypes serve as initial three-dimensional sketches and are then replaced by iterations of successively more refined versions” —Bjarki Hallgrimsson

Behind every successful design is a story of numerous refinements and long hours. Prototyping is a key problem-solving activity that starts at the beginning of a project and continues through into the fabrication phase. Prototypes range from preliminary to finished versions, and can be executed by hand (cardboard, foamcore, clay, etc.) or rapid prototyping (computer-driven printers, CNC mills, laser cutters, 3D printers, etc.).
Often simple and low-cost materials can adequately serve to simulate a design idea, allow for study and compare alternative design approaches. Working at scale (actual size) and in three dimensions will quickly move the design from concept to a refined solution, allow for important user testing and facilitate buy-in from a team. Prototypes allow for quick iterations based on the same idea, and transition the project into design detailing.
Learning Outcomes

Select the appropriate communication tools to represent design concepts that integrate knowledge of materials, color, typography, form, space, structure, tactility, multi-sensory experiences and interactive media.

Execute a series of hands-on and iterative material and/or fabrication studies as part of an experimental research plan.

Test the integration of materials, technology and fabrication through at scale or proportional mock-ups/models within relevant spatial contexts and user scenarios.

Analyze the effectiveness of design concepts/prototypes through formative evaluation with human participants addressing relevant accessibility, human factor and sustainability criteria.

Communicate findings of experimental research and prototyping through written reports, visual analysis and presentations at critical junctures in the development and approval process.
Case Studies per practice area

**Wayfinding**

**Davis Pathfinder**
Designer: City of Davis; Fabricator: UC Davis Sign Shop
Actual size prototype to evaluate scale, contrast and message hierarchy.
Adhesive vinyl print on cut aluminum.

**Exhibitions**

**Home Lands: How Women Made the West, Autry National Center**
Designer: munizmcei; Fabricator: Cinnabar
Scale model of exhibit to test object placement and relationships.
3-D printed figure, inkjet print, paper and foam board.

**Wayfinding**

**Cal Edison DTLA, Rising Realty Partners**
Designer: Altitude Design Office; Fabricator: WeidnerCA
Art Deco inspired rosette sign element presented to client for approval.
Painted 3-D printed object and brass prototype.
Case Studies per practice area

Wayfinding
Manetti Shrem Museum of Art, Davis CA
Designer: Tim McNeil; Fabricator: UC Davis Reprographics
Actual size prototype to evaluate scale, placement and legibility. Inkjet print on vinyl hung by crane.

Placemaking
Open office cubicle name plaques, Bloomberg
Designer: Volume Inc.; Fabricator: WeidnerCA
Actual size prototype presented to the client to show real world application and functionality. Painted acrylic, metal and vinyl.

Signage
World of Coca Cola, Atlanta
Designer: Selbert Perkins.; Fabricator: Design Communications Ltd.
Scaled prototype for large complex monument sign. Painted 3-D printed object, acrylic and metal.
Resources

Books

Prototyping for Designers: Developing the Best Digital and Physical Products, Kathryn McElroy, O’Reilly, 2017

Prototyping for Architects, Mark Burry and Jane Burry, Thames & Hudson Limited, 2016

Prototyping and Modelmaking for Product Design, Bjarki Hallgrimsson, Lawrence King Publishing, 2012


Designing Interactions, Bill Moggridge, MIT Press, 2007