

ARC 328W / 392W

Wood Design

Unique # 00780 / 01195

Spring 2019

TTh 2:30 - 5:30 pm

Build Lab GOL 1.101

Instructor – Mark Maček

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office hours

by appointment

GOL 3.106

Objectives

Practice woodworking skills: tool sharpening, layout, millwork, joinery, gluing, & sanding.

Learn the characteristics of the material wood, including specific species.

Analyze the strength of wood joints.

Design a piece of furniture based on a program, with materials and techniques in mind.

Understand the point of view of the maker within the design process.

Complete the final project.

Schedule

The first six weeks, we practice solid wood joinery using hand tools and power tools. This is a crucial time to attend every day and stay current. There will be an assignment each week due on Tuesday morning. Students sharpen chisels and mill lumber so it's flat and straight. Our discussions are grounded in wood's cellular structure and anisotropy. Strength derives from long grain, weakness from the lack of long grain. Changing moisture content creates expansion and contraction in predictable ways. We will study furniture design history and visit the shops of Austin craftspeople to see how they work.

The final project is one piece of furniture of your choice of program. It must be mostly solid wood, no digital fabrication, and no larger than 25 cubic feet. Final project design assignments include sketches, scaled drawings, models at 3"=1'-0", and full-scale mock-ups. The class holds two design reviews before construction begins, allowing seven weeks for completion. The class participates in school-wide final reviews with other design studios. Begin now thinking about what you want to build for your final project. On the seventh week, your proposal will be locked in.

Week 1, Jan 22

Thursday - Handout and lecture on the properties of wood: cellular structure, grain direction, and movement with changes in moisture. Demonstration of milling lumber to S4S (surfaced four side) with joiner, planer, table saw, and chop saw.

Assignment – Students repeat milling procedure on 2x4's which they have purchased. Closely observe the results. Due Jan 29

Week 2, Jan 29

Tuesday - Review milling exercise results and discuss grain direction. Demonstration of chisel sharpening with bench grinder and whetstones. Discussion of router, changing bits and to use the router to cut hinge mortise, how to use the chisel to cut the corners square.

Assignment – Repeat hinge mortise exercise 3 times in 2x4's and once in hardwood sample.

Assignment (Design/build 1) – Build a wood box by next Tuesday, 27 cubic inches inside, any method. No joinery has been taught yet, so students must improvise. Gluing wood together is acceptable. Due Feb 5

Thursday - Demonstration of Japanese saw for cross-cutting 2x4 by hand. Demonstrate the dado saw and the fence to cut a precise half-lap joint in 2x4's, using test pieces

Assignment – Using Japanese saw, cut four samples of 2x4 square on ends.

Assignment – Repeat dado saw half-lap exercise on 2x4's.

Week 3, Feb 5

Tuesday - Review box designs and use the boxes to discuss craft techniques and gluing wood cross-grain. Review cross-cuts and half-laps. Discuss the hand tools in the class locker. Demonstrate hand plane use and care. Slide show of Design History images of furniture design, particularly Eames, Aalto, Nakashima, Wegner, differences between solid-wood construction and veneer or laminated construction, compare bent-lamination technique to steam-bending.

Assignment – Cut Block (see drawing) from cherry lumber with hand tools only. Discuss specific techniques. Due Feb 12

Thursday - Distribute handout with comprehensive list of joint types. Discuss joint names, mechanical properties, and strength analysis. Demonstrate mortise-and-tenon joint in 2x4's with horizontal mortiser, chisel, and dado saw.

Assignment – Repeat mortise & tenon exercise. The goal is tight fit on long grain and shoulder.

Assignment – Read David Pye, *The Nature and Art of Workmanship*, chapters 1-4, 7, 11, 12.

Week 4, Feb 12

Tuesday - Review Block. Review m&t joints. Discuss Pye. Define craft, workmanship of risk, workmanship of certainty, diversity of scale, rough vs. precise, and designer's intention. Slide show featuring examples of wood movement, wood engineering characteristics, shaping wood in 3D, fasteners, construction techniques, laminated products, and some architectural applications.

Assignment – Schematic Design of Final Project, choose program, discuss parameters. Schematic Design review Feb 19

Thursday – Demonstrate edge-gluing two boards and clamping tactics. Demonstration of screws, pilot holes, counter bores. Demonstrate slip tenons such as biscuit joiner and Domino machine.

Week 5, Feb 19

Tuesday - Final Project Schematic Design review and discussion with entire class. Demonstrate 3D shaping tools and techniques.

Assignment (Design/build 2) – Make a Handle for prospective application by shaping wood in 3D. Handle due Feb 26.

Thursday – Class field trip locations:

The house of Jean Mather whose husband Bob Mather taught Wood Design for ten years. There are many examples of Bob's furniture, architecture, and interior design.

Second stop is the studio of Philippe Klinefelter, public art sculptor, friend and cohort of Bob Mather. Philippe has over 10,000 hours experience in three media- wood, metal, and stone.

Maček Furniture Company to see current projects and older designs.

Week 6, Feb 26

Tuesday – Review Handle assignment. Discuss buying lumber at hardwood lumber stores, nomenclature, lumber grading, define the unit of one board-foot. Demonstrate hand cutting single dovetail joint using hand tools.

Assignment - Repeat dovetail joint four times in two species of wood.

Assignment – Final Project Design Development, required model at 3"=1'-0" due Mar 5.

Thursday – Discuss hardware, hinges, drawer slides

Week 7, Mar 5

Tuesday - Design Development Review with guest critic.

Assignment – Make design revisions based on review discussion.

Thursday – Discuss handouts regarding construction drawings, cut lists, and full-scale mock-ups. Discuss wood species characteristics with 25 samples of hardwood, softwood, and engineered products. Discuss imported lumber vs. domestic and standards of sustainably harvested wood.
Assignment – Work on shop drawings and cut list.

Week 8, Mar 12

Tuesday – Read handout comparing wood finishes. Look at finish sample library and discuss. Hold individual desk crits with students needing design advice.

Assignment – Buy lumber for final project

Thursday – The rest of the semester, studio time is devoted to individual discussions with students regarding technique, design, construction sequence, and schedule.

Assignment - Begin full-scale joinery details, create schedule for final project.

Week 9, Mar 19 - Spring Break

Week 10, Mar 26 - work and desk crits

Week 11, Apr 2 - work

Week 12, Apr 9 - work

Week 13, Apr 16 - work

Week 14, Apr 23 - work

Week 15, Apr 30 - work

Week 16, May 7 - work, final project review on May 10

Readings

Required reading: The Nature and Art of Workmanship by David Pye.

There will be handouts. List of bookmarks at www.diigo.com/user/wooddesign

Design History images on Canvas

Grading

First 6 weeks 25%

Final project 75%

The first six weeks are graded on effort, timeliness, and craft. I evaluate final project designs based on intent (expression of a design idea), process (self-criticism, iterations, variations), and resolution (effort and craft). After the last day of the semester, the wood shop hours are shortened. A grade of incomplete will only be granted for illness or family emergency.

Safety Training

All students must take UT's Environmental Health and Safety department online training (https://utdirect.utexas.edu/ehs/class.WBX?s_course_comp=0&s_course_prefix=OH&s_course_number=0500) and pass a short exam at the end in order to enter the shop.

All Wood Design students are required to take John Vekho's shop safety orientation.

Accommodations

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259.

Absence policy

Four unexcused absences will result in a full letter drop in your grade for the semester. Contact me ahead of time if you plan to miss class, and notify me as soon as possible if you are sick or have a family emergency. By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of a religious holy day. You will be given an opportunity to complete the missed work within a reasonable time after the absence. Please keep me informed so that I can help you.

Required supplies

Lock for desk

Tape measurer, combination square, 1" chisel

Dust masks. The good ones have two straps.

Lumber

Keep the shop clean

CLEAR your bench top and sweep the floor at the end of work day.

The only available scrap wood is in the scrap bins.

When gluing, cover the bench top with newspaper or wax paper.

Observe safety rules and tool maintenance

Wear hearing, eye, and respiratory protection.

No MDF. No reclaimed lumber unless specifically approved.