

COLLEGE OF DESIGN WORKSHOP

General Shop Procedure & Policy

*** READ COMPLETELY ***

Shop access is a privilege binding on full compliance with Procedure, Policies and Limitations as described below and in detailed postings throughout the Design Workshop. Due to extreme hazards connected with the use of the equipment, and the importance of the shop equipment to all students within the College of Design, anyone failing to recognize & comply with shop operating Procedure and Policy will be denied use of the Shop Facilities.

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~GENERAL SHOP PROCEDURE & POLICY~

Conduct

1. Due to limitations in space & tools, use of the shop shall be permitted only to people within the College of Design.
2. NO ONE can have access to the Design Workshop until they have completed a Shop Orientation Session with a Shop Instructor.
3. Student I.D. is required to use facility or check out tools. (see *tool-checkout*, pg 4)
4. Use of the shop facilities shall occur only during designated shop hours. Under no circumstances shall anyone use the shop facilities without the presence or permission of the Shop Instructor.
5. Use of the shop equipment & machines shall be restricted to persons having proper knowledge of the machines to be used. When in doubt check with the Shop Instructor.
6. The Design Workshop is not available for personal or trivial operations.
7. Avoid talking to anyone who is operating a machine; distracting or startling anyone operating a machine may result in serious injury.
8. Horse-play is absolutely forbidden in the workshop.
9. Care should be taken to see that all lumber is free from nails, paint, dirt and loose knots prior to being machined.
10. Many times the same operation can be performed on a variety of machines; select the machine that will do the operation best, easiest and safest. If uncertain, consult the Shop Instructor.
11. Make sure vacuum is active whenever using equipment attached to the vacuum system. Any operation that produces excessive dust should be done near a vacuum hose.
12. **Everyone using the shop facilities is required to clean up equipment, floor and workspace immediately after completing operations. Not doing so can void access to the shop!**
13. The shop is not responsible for any replacement of material that may be damaged or cut wrong by any machine, shop personnel, or unfortunate damage by nature.

Safety

1. Individuals should not use wood working machines until they have received instructions on their safe use.
2. Wear face shield or goggles on all operations that may create flying debris (all power saws, grinders, routers, drills, etc.).
3. Never wear loose clothing, gloves, jewelry, etc. that could get caught in equipment; always tuck in shirts, ties and roll up sleeves whenever operating a machine.
4. Use ALL appropriate safety equipment provided for equipment (goggles, guards, milling fixtures, etc.).
5. Report unsafe equipment or conditions to the Shop Instructor immediately.
6. Do not take your eyes off your operation nor allow others to crowd around and watch you at the machine.
7. Floors and areas around machines must be kept clean of scrap.
8. Stock should only be fed into machine after the motor has reached its maximum speed.
9. Stock should never be forced into a machine faster than it will cut.
10. Before starting equipment, be sure there is ample space around you and the equipment to complete the operation.
11. Allow machine to come to a complete stop before making measurements, adjustments, or leaving the machine.
12. In the event of injury of any degree notify person in charge and receive first-aid.
13. Pull the MASTER switch or disconnect the plug from the wall receptacle before making repairs, changing blades, cutters, knives, lubricating the machine or sharpening knives on any equipment.
14. All tools such as wrenches, screw drivers, etc. must be removed from the machine before power is turned on.

Tool Check-Out

1. Because of the limited supply of tools and the broad family of students, only a selection of duplicate tools may be checked out of the workshop.
2. NO tool can leave the COD premises.
3. Student I.D. number, phone number, and destination is required before any tool can be released.
4. Maximum tool check-out time limit is one day. Anyone who checks out a tool shall be held responsible for its return at the designated time & for its condition upon its return.
5. Any tool removed from the shop without permission from the Shop Instructor will be considered stolen, and the person(s) involved will lose access to the shop.
6. Tool Check-out is logged. Students with frequent or excessively late returns will loose check-out rights for weeks or more. Be considerate, return tools so others can use them!

Materials

1. Due to the hazards presented to machine operators and the machines being used, any materials having the possibility of containing broken-off nails, or other bits of metal cannot be worked in the shop.
2. Due to the hazards presented to machine operators and the machines being used, treated lumber is prohibited in all equipment.
3. Each piece of equipment is intended for a limited range of materials. Before operating any piece of equipment, read posted guidelines specific for that tool and/or consult the Shop Instructor to be sure it is the best choice for the task and material at hand.

~SPECIFIC TOOL GUIDELINES~

SAFETY INSTRUCTIONS FOR THE BANDSAW

1. Students are not allowed to operate the bandsaw until they have passed a test covering the basic operations of the bandsaw.
2. The saw guide must be adjusted within ¼” of the stock to be cut before power is turned on.
3. Students must not allow their hands across the saw line when operating the bandsaw.
4. Keep your fingers at least 2” away from the blade when operating the bandsaw.
5. Students must not stand at the right side of the bandsaw when operating the machine. Generally, you will stand in front of and slightly to the left.
6. If necessary to back saw out of a long cut, power should first be turned off and the machine let come to a complete stop.
7. Cylindrical stock must never be cut without the aid of an appropriate jig.
8. Stock must never be cut on the bandsaw unless the material is firmly supported against the downward thrust of the saw.
9. If the bandsaw blade should break while machine is in operation, immediately turn off the power, keep clear of the saw & notify the instructor.
10. Be sure the radius of your cutting is not too small for the width of the bandsaw blade.
11. Again, REMEMBER, if you do not thoroughly understand how the machine operates, ask the instructor for help.
12. THINK SAFETY, PRACTICE SAFETY, DEVELOP GOOD SAFETY HABITS.
13. Make certain that the blade is tracking properly and the guides & rollers are adjusted correctly. RECEIVE PERMISSION from the instructor before adjusting blade tension or tracking.

SAFETY INSTRUCTIONS FOR THE TABLE-SAW

1. Be sure that the machine is sharp & in good working order before turning on the power.
2. Keep floor around the machine clean.
3. Keep other areas around the machine clean.
4. Use a helper if one is needed.
5. Let the machine come to a dead-stop before turning on the power.
6. Do not lay tools on the table-saw.
7. Check all setups carefully before turning on the power.
8. Keep mind & eyes on the job; avoid talking to anyone.
9. Keep sleeves above the elbow; tuck necktie in shirt or remove; never wear gloves.
10. Keep guards in place and use whenever possible.
11. Never release stock between saw & fence; push all fenced stock completely past the blade.
12. Keep stock flush with table surface.
13. NO FREEHAND SAWING! Always use fence or miter-guide to carry stock through blade.
14. Do not try to rip stock that is shorter than the blade diameter.
15. Do not crosscut stock shorter than 8”.
16. Use a clearance block when making duplicate cuts with fence & miter guide on opposite sides of the blade.
17. Never reach over the saw to hold stock.
18. Do not try to remove stock near the saw blade
19. Do not try to feed stock into the machine faster than it will cut.
20. Never cut stock that has been nailed, painted or has loose knots.
21. Cut power immediately after finishing operation.
22. If a machine malfunctions or becomes inoperable, mark “out of order” and notify staff.
23. Turn off & unplug when changing blades.
24. Be certain that any stock held against the fence has sufficient bearing surface.

SAFETY INSTRUCTIONS FOR THE SCROLL SAW

1. Select the correct blade to do the best job.
2. Install blade with proper tension with teeth pointing towards the table.
3. Revolve saw by hand to check adjustments before turning on the machine.
4. Set hold down on the surface of the stock to hold the work firmly down on the table.
5. Plan your cuts to avoid backing out of a cut.
6. Keep hands well away from the moving blade and out of the cutting path.
7. Make turns carefully – do not try to turn small radii with large blades.
8. Do not cut cylindrical stock without a jig or other adequate holding device.

SAFETY INSTRUCTIONS FOR THE MITER SAW

1. Always wear shatter-proof face shield or safety goggles.
2. Only cut wood products, PVC, or acrylic. NO METALS.
3. Stock must be no more than 3-1/2" thick, and a maximum of 12" wide.
4. Length of stock must leave 8" or more to the left of the blade in order to keep a firm grip while cutting.
5. Stock must be firmly pressed against the fence for all cuts.
6. Keep hands at least 4" from blade while cutting.
7. Saw must be at full speed before beginning any cut.
8. Begin all cuts with saw pushed completely forward, and then, if necessary, pull saw through material.
9. For multiple cuts of the same length, a stop block can be clamped to the fence, preferably to the left of the saw.

SAFETY INSTRUCTIONS FOR THE DRILL PRESS

1. Remove chuck-key from chuck before starting machine.
2. Be sure the bit is tight in the chuck.
3. Be sure small stock is secure in vise or fastened to table.
4. Adjust speed of machine to size of drill & type of job.
5. Avoid forcing bit faster than it will cut.
6. Keep hands at least 2" away from moving bit.
7. Never brush chips away with your fingers.
8. Set the work up in such a manner that the bit will not damage the table.
9. Make adjustments to the machine only after it has come to a dead stop.
10. NEVER attempt to install a square tang or taper shank drill, bit or other devices in a three jaw chuck.

SAFETY INSTRUCTIONS FOR THE ROUTER TABLE

1. Always use the guard.
2. Use fence whenever nature of work permits.
3. See that blades of cutter are sharp.
4. When machine is set up, check to see that all adjustments are tight.
5. Do not overload the machine; take two cuts if necessary.
6. Run stock slowly when finishing across end grain.
7. Avoid getting hands or face in-line with flying splinters.
8. Always hold stock with both hands & feed slowly.
9. Throw the main switch before making adjustments or changing cutters.
10. Students must have special permission from the instructor before using the router.
11. Be sure that shaper is running at full speed before using.

SAFETY INSTRUCTIONS FOR THE JOINTER

1. Students are not allowed to operate the jointer until they have passed a safety test covering the basic operations of the jointer and have passed an individual “check-out” on the actual operation of the machine.
2. The guard must be kept over the knives at all times while the jointer is in operation. Never drag stock back across the guard.
3. The jointer can not be used for jointing stock measuring less than 12” long.
4. Set-ups on the jointer for special operations, such as beveling, tapering, etc. must be checked by the instructor before the power is turned on.
5. Check for a tight fence and adjust depth of cut before turning on the power.
6. Do not adjust the fence while the machine is in motion.
7. End grain jointing on pieces less than 12” wide is prohibited. Stock pieces 12” wide or greater can be successfully jointed against the end grain by performing the following operation. First, advance the board across the knives approx. 1”. Second, turn the board around and joint all the way across.
8. The jointer must not be used for cuts greater than 1/8” without the instructor’s permission.
9. Do not let your fingers project over the knives while jointing stock.
10. Examine the stock for knots and splints before running it over the jointer. Always join with the grain.
11. Always use a slow, steady advance when jointing stock.
12. The outfeed is not to be adjusted by any student.
13. Use a push-shoe when on all stock thinner than 3”.
14. Always keep your attention fixed on the job you are performing.
15. Remember, if you do not fully understand how the machine operates, ask the instructor.
16. THINK SAFETY, PRACTICE SAFETY, DEVELOP GOOD SAFETY HABITS.

SAFETY INSTRUCTIONS FOR THE PLANER

1. Students will not be allowed to operate the planer until they have passed a safety test covering the basic operations of the machine.
2. Never stand directly behind the board when it is being fed into the planer.
3. Check material BEFORE feeding it into the planer. Dirt & grit cause damage to the knives. When planing several pieces, station yourself where you have quick control of the infeed lever. Should you notice some rock or defect in the material that could damage the knives you can quickly stop the stock as it is being fed in to the machine by disengaging the infeed lever.
4. Keep your fingers away from the sides and bottom of the board as it is fed into the planer.
5. Always measure the board at its thickest point and adjust the planer to about 1/16" less than that measurement.
6. Never try to plane more than one thickness at a time.
7. After the first cut is taken, re-adjust the planer another 1/16" less and take the second cut.
8. Never adjust the depth of the cut while the stock is being fed into the machine. If the stock won't feed into the machine, the infeed roller is not engaged, or you are trying to take too heavy of a cut.
9. Never attempt to clean away shaving until the machine has COMPLETELY stopped.
10. Never look into the planer while it is in operation.
11. Always turn on the vacuum first, before starting the planer.
12. The correct position to operate the planer is to stand to the left or right of the machine near the controls.
13. Keep your attention fixed on the operation performed.
14. Do not surface warped or twisted boards until a true surface has been established, either with a hand planer or a jointer.

SAFETY INSTRUCTIONS FOR THE GRINDER

1. Keep all guards and shields in place.
2. Use shatter-proof face shield or goggles for all grinding operations.
3. Set tool rest 1/8" to 1/4" from grinding stone to prevent pieces from being caught between the rest & the stone.
4. Keep fingers clear of stone, particularly the area near the tool rest.
5. Badly worn or out of round wheels should be dressed or replaced.
6. Tool being ground should be held firmly
7. Always use the face of the wheel.
8. Replacement wheels should be those recommended for use at the speed of the machine.

SAFETY INSTRUCTIONS FOR THE WOOD LATHE

1. Adjust the speed of the lathe according to the size and condition of the stock. Check for checks, knots, etc.
2. Be sure the stock is secured before turning on the lathe.
3. Use appropriate tool for the job.
4. Keep all tools sharp.
5. Keep the tool rest adjusted close to the stock.
6. Stop the lathe to make all adjustments.
7. Avoid placing hands on stock while rotating.
8. After stock is centered, rotate by hand to make certain it will clear the tool rest.
9. Before sanding or finishing, remove the tool rest to prevent fingers or clothing from being caught between it and the stock.
10. Face plate stock must be securely fixed to face plate with screws of proper size.
11. When turning large diameter work reduce R.P.M gradually to reduce the possibility of stock being thrown out of the lathe.
12. Lathe tools should not be placed on the lathe bed.
13. Hold turning tools firmly at correct angle.

~COMPUTER-AUTOMATED MACHINERY~

General Guidelines

1. CAM equipment is directly operated *only* by qualified staff, and available only to COD students.
2. It is the students' responsibility to prepare jobs according to the guidelines below, provide corresponding materials, and promptly remove finished jobs and debris.
3. Generally, jobs are "first-come first-serve"; individuals must have jobs loaded & checked to be in line.
4. Under special circumstances, a professor can reserve a time for a studio to have priority access. Such accommodations must be planned early and strategically, to avoid conflict with other studios.

UNIVERSAL V-460, 60W CO₂ Laser ; Dual 60W Laser

1. This laser can cut both vector line drawings as well as raster images. Note that vector lines cut *fast*, and raster images cut *slow*.
2. Laser cutting jobs can be sent from a variety of CADD software, including AutoCAD, Rhino, CorelDRAW, Photoshop, etc.
3. Prepare laser plots to fit within the 24"x18" or 36"x18" laser bed.
4. Differentiate cut lines and varying depths of etches using simple RGB colors. Upon sending a job to the laser, we will assign appropriate power settings to each of those colors. The laser will execute in the order of the following colors: (1)Black, (2)Red, (3)Green, (4)Yellow, (5)Blue, (6)Magenta, (7)Cyan and (8)Orange. Assign etch lines to cut first and cut lines to cut last to avoid material shifting in the process. Colors not mentioned here will not be recognized by laser
5. Acceptable materials include Wood, Chipboard, Paper, Acrylic sheet, Melamine, Rubber and some Plastics. Glass can be etched, but not cut.
6. PVC and Styrene are not acceptable, as they release toxic fumes when cut. NOTE: Some plexi has PVC ingredients; only buy ACRYLIC PLEXI!
7. Maximum cut depth is generally 3/8", but may be far less depending on density of material.
8. Important: make sure there are no double-lines (line on top of another line). This will cause double-cuts, leaving extra sooty edges on cuts, and turning etch-lines into cut lines.

XYZ Millennium & Precix CNC Router

1. The CNC ultimately is a powerful rotary tool affixed to a 3-axis robotic track system. This can house a wide variety of standard router bits for jobs ranging from straight, 2-dimensional cuts to complex 3-dimensional surfaces, such as topographic models.
2. These begin with CAD drawings, usually from AutoCAD or Rhino, from which 'toolpaths' are created in the CAM lab and sent directly to the CNC.
3. CADD models must be of NURB Surfaces to create 3D toolpaths.
4. Setup time for 2D cuts is fairly short, but more complex 3D surfaces may take an hour or so, depending on job size and workload elsewhere in the shop. COME EARLY!
5. Cut speed also is fairly short for 2D cuts (minutes, maybe an hour), and can be quite lengthy for 3D surfaces (2 to 6 hours). COME EARLY!
6. Bed Size is 48"x40". In planning any CNC job, keep in mind you need four or more points for anchoring your material within the workspace. Anchoring methods include screwing your material into the sacrifice board, or mounting block anchors around the perimeter. The later method will reduce the usable area by 4-6 inches in length and width.
7. Preferred materials include Wood, MDF, and cardboard. Plexi and non-ferrous metals are acceptable, but avoided due to noise & blade stress.
8. Limitations on material & depth of cuts depend primarily on the types of router bits available. The maximum thickness that the machine will allow is 3½".
9. Precix CNC max stock size is 48"x 96"x12". Machine use is same as above. Shop does not provide cutting bits.

Uprint Plus & Dimension 1200 ABS Plastic 3d Printers & Z 310 Starch Printer

1. The plastic 3d printer build sizes are 10"x10"x10" and 8"x8"x6". The starch printer build bed is 8"x8"x10"
2. The file must be water tight and in STL file format.
3. The 3d printers are restricted to current studio projects unless authorized by professor or shop personel.

*** All digital machines are first come first serve. File must be finalized and submitted to shop to be put in queue if machine is busy.**

Shop Safety Course

I have read and agree to the terms of using the shop facilities.

_____ (signature)

_____ (date)

_____ (student ID #)