

The School of Arts maintains a variety of power tools for student and faculty to use **WITH SUPERVISION**. These policies and procedures are intended to allow students, faculty and staff to **SAFELY** access, maintain and maximize the use of equipment.

To safely serve as many students as possible, please arrive with your materials marked and have a layout or drawing of your planned cuts. You will not be rushed in the operation of power tools, but you must come prepared to use the machine time efficiently. **UNPREPARED STUDENTS WILL NEED TO LEAVE AND RE-SCHEDULE. If appointments fill up, being unprepared will put you at the end of the line.**

Students and faculty are expected to be cooperative with the staff in coordinating and scheduling the use of the equipment according to the given guidelines and procedures.
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ACCESS TO ARTS 344: STUDIO, WOODSHOP, METALSHOP

1. **The Arts Studio Woodshop & Metalshop** is open by appointment for authorized students:
Appointments Available: Monday-Friday from 9:30 am – 1:00 pm
2. All appointments are made in advance by visiting the SofA website or following this link: [Arts Technical and Facilities Support](#).
3. **Before entering Arts 344 Studio**, you should wash/sanitize your hands and have your face covering on. While in the Arts Complex, you are required to:
 - Abide by all signage;
 - Wear your facial covering (e.g., masks or face shields);
 - Always cough or sneeze into your elbow or tissue; and
 - Adhere to other health and safety protocols and directives for campus.
4. All students who make an appointment to use the Arts Studio:
 - a. Must be a current California State University, San Marcos student;
 - b. Be on a SofA approved list for class studio use.
5. Prior to using each power tool, students are required to present a completed Safety Training Log for that tool.
6. Rules and regulations for supervised power tool use applies to all School of Arts and campus members.
7. Enrolled students will automatically be added to the appropriate Arts equipment access list at the beginning of the semester. The access list is based on the current course roster. If there are add/drops at the beginning of the semester, the instructor is responsible for notifying Arts Technical Support.
8. Whenever possible, faculty members should collaborate to stagger assignments to ensure the most efficient use of the equipment.

9. The open studio system relies on each student, faculty member, and staff to abide by **every safety measure always**.

SAFETY TRAINING PROCEDURE

1. **AT HOME** – Read and review the safety procedure for each machine you plan to use.
2. **AT HOME** – Watch the designated safety video for each tool you plan to use.
3. **AT HOME** – prepare to use the time on campus efficiently by planning your cuts and marking an estimated layout directly on your materials to be cut. A mock-up made of paper or cardboard can help you figure out your build plan. At the very least, prepare a drawing with some dimensions.

Students who don't have these first 3 steps completed at the time of their appointment will need to reschedule

4. Complete a safety tutorial with the shop technician for each tool you plan to use.
5. Perform a safe practice cut under direct supervision for each tool you plan to use.
6. Once you are safe and competent using a tool, sign-off that tool on your Safety Training Log and you may use that tool for the rest of the semester with general supervision.
7. Always review a tool and ask the shop technician for help whenever you have a question. Always perform a dry run with the **POWER OFF** before using a tool for the first time or the first time *in a while*.
8. Always ask the shop technician to check your setup if you have **ANY** questions or if you want to use a tool *differently* than you have used it in the past.

PERSONAL RESPONSIBILITY

1. Before student, faculty, and staff may use any SofA equipment, the Arts Safety Training Policies and Procedures must be read.
2. Prior to student, faculty, and staff using each specific power tool, the Safety Training Log for that tool must be completed and processed by the Shop Technician.

3. ***Signing the Safety Training Log next to each tool acknowledges that you and the Shop Technician are confident you can operate that tool safely with general supervision.***
4. Students must complete a new or review Safety Training each semester.

POWER TOOL LIST

WOODSHOP

Table Saw
 Miter Saw
 Band Saw
 Scroll Saw
 Drill Press
 Spindle Sander
 Wood Lathe
 Router Table
 Belt/Disk Sander

HANDHELD

Jig Saw
 Drill
 Dremel
 Electric Sander
 Angle Grinder
 Sawzall
 Pneumatic Staple Gun

METALSHOP

Mill
 Metal Lathe
 Metal Chop Saw
 Metal Scroll Saw
 Metal Band Saw
 Metal Drill Press
 Grinder
 Mig Welder
 Plasma Cutter

To minimize exposure time on campus, students must read the safety procedure and watch the video for each tool they plan to use. This should be done AT HOME *prior to your first visit to the shop.* The general and specific safety procedure and video for the most commonly used tools follows. For all other tools, please contact the Shop Technician, Judy Ryan.

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ARTS 344 SAFETY OVERVIEW

Operating any power tool requires your full attention and an understanding of how the tool will function. These policies and procedures offer the essentials of power tool operation and safety. Operator error is the number one reason for any power tool accident. Our goal is to prevent **ALL** accidents in the Arts shop.

The pictures in this manual are intended to help you visualize and familiarize yourself with the knobs, fences, blades, knives, etc. referred to in the text. *Detailed instructions* for each machine are contained in the User Manual posted by the emergency power shut off near each machine. *At-A-Glance safety reminders* are also posted at each machine. The Shop Technician will always be available to supervise and review any tool when the shop is open. **UNSUPERVISED STUDENT SHOP USE IS NEVER PERMITTED.** If you haven't used the shop in a few days, please review each tool with the **POWER OFF** before making your first cut.

GENERAL ARTS SHOPS POLICIES AND PROCEDURES

1. You are not compelled to use any power-driven machinery. You may be excused from using any machine.
2. **Safety glasses** must be worn while using any power tool.
3. All work to be done in the shop must have the professor's or shop technician's approval.
4. If you feel ill, do not operate machinery.
5. Wearing gloves is **forbidden** when you are working with power-driven machinery.
6. Remove **dangling jewelry** and other accessories that are hazardous.
7. Always keep machines safety guards in proper position.
8. Overloading or forcing in any manner any machine is dangerous.
9. If a machine makes an unusual sound or is found to be out of adjustment, or in need of repair, it should be reported to the shop technician **immediately**. **ONLY MACHINES IN GOOD REPAIR MAY BE OPERATED.**
10. You must **avoid distracting** the attention of individuals using machines. Likewise, you must not allow your attention to be diverted while you are using a machine. **Distractions can cause the operator to make serious mistakes. DO NOT** use your cell phone while operating a machine.
11. Use the proper tool for the job.
12. Only the operator must turn the machine on and off.
13. Only the operator must control the workpiece being cut.
14. Keep the floor area surrounding the machine clear of slippery sawdust and scraps.

15. If you are in doubt about the use of any tool or machine for a specific job, or about any shop procedure, **ask the shop technician for help.**
16. The term “**margin of safety**” refers to the minimum distance that the operator’s hands and fingers must be from the cutter, blade, bit, etc. The margin of safety is **STRICTLY ENFORCED** for each machine.
17. You should always seek to keep hands and fingers as far away from blades and cutters as possible without sacrificing control of the workpiece.
18. Detailed instructions for each machine are contained in the User Manual hanging up by the emergency power switch of each machine.

BANDSAW SAFETY PROCEDURES



1. The BANDSAW can be used to cut straight lines or gentle curves.
2. Adjust the guard to about 1/2" above the thickness of the wood, with the machine at a full stop.
3. Allow the saw to reach full speed before starting to feed the work.
4. Operators must not allow their fingers to come dangerously close to the saw when cutting stock. A **2" MINIMUM margin of safety** must be maintained. ALWAYS be aware of your fingers and their proximity to the blade.
5. Use a push stick for cuts near the saw blade. Do **NOT** push the workpiece through the blade with your hands when less than 2" from the blade.
6. If it is necessary to back the saw out of long cuts, turn the power off first and allow the machine to come to a dead stop. If the stock binds or pinches the blade, do not attempt to back out until power has been shut off and the machine stops. Twisting, binding, or pulling the saw blade off the wheels while backing out of a cut is the usual cause of a broken saw blade.

7. Cutting cylindrical or irregular stock on the band saw may be done only with a special holding jig, such as V-blocks.
8. Plan cuts carefully; layout and make “relief” cuts before cutting long curves and curves of small radii. Turning holes should be made when possible. Plan work so that all cuts will be made in the forward direction.
9. When removing scrap material from the saw table, **always be aware of the blade**. Use a piece of scrap to push away and remove scrap pieces. **Do not use your hands**.
10. If blade breaks, stand clear, shut off power if possible and keep others clear until machine stops completely. Notify the shop technician.
11. Make all cuts under power—never while machine is coasting.
12. Walk away from the machine **ONLY AFTER** power is turned off and the blade has come to a complete stop and been covered by the guard.
13. Never adjust the saw while it is running.

MITER SAW SAFETY PROCEDURES



1. The Sliding Compound MITER SAW can be used for cross cutting, trimming to length, and making angled and compound angled cuts.
2. Maintain a **6" MINIMUM** margin of safety at all times. Small pieces may not be cut on the miter saw if your hands cannot be a safe distance away from the blade.
3. The compound miter saw is not intended to be used to cut rough lumber since it may bind in the blade and cause kickback.
4. Keep wood held firmly **DOWN** against the table and **BACK** against the fence throughout the cut.
5. The blade should be at full speed before contacting the wood. Do not force the tool into the work. Move the blade only as fast as it can cut without overloading the motor.
6. When adjusting the miter saw, make sure the power cord is unplugged.
7. The blade should come to a complete stop before lifting it out of the work piece. Do not retrieve off cuts until the blade has come to a full and complete stop.
8. When cutting a wide board, first slide the saw all the way towards you, then turn it on, then push down, then push forward. Never pull the saw towards you while it is cutting.

SAWSTOP* TABLE SAW SAFETY PROCEDURES



1. The TABLE SAW can be used for ripping flat wood with a straight edge against the fence. A rip cut is a cut lengthwise or “with the grain” (...or hotdog).
2. The table saw should not be operated by a careless person or one who has not made a study of its capabilities and limitations.
3. **DO NOT OPERATE THE TABLE SAW UNLESS you know what kickback is, what causes kickback, and how to prevent kickback. If you’re not sure, ask the shop technician.**
4. Maintain a **MINIMUM 6” margin of safety**. Use a push stick when ripping narrow pieces that are less than 6” in width.
5. Never lower pieces of stock directly down over the saw blade. This operation is dangerous and may result in kick back.
6. A splitter or riving knife must be in place for rip cuts. Ask the shop technician before replacing the splitter with the riving knife.
7. When cutting, the saw blade should project 1/4”, or enough to clear the gullets, above the stock you are cutting.
8. All adjustments are to be made only while the saw is at a complete stop with power off.

9. After completing a cut, lift your free hand up from the table. Bring your other hand around the backside of the fence. Do not drag your hand across the table. Walk around to the back of the blade to retrieve your rip cup. Get in the habit of NEVER pulling your wood back towards you. Doing so with the saw on will cause kickback.
10. **Freehand cutting, ripping or crosscutting, without using the fence or miter gauge is absolutely forbidden.**
11. When ripping on the table saw, it is imperative that the **longest dimension** of the board is held tight against the fence.
12. When ripping with the table saw, exert pressure (either with a push stick or your hand, dependent on the size of the stock). Pressure should be **DOWN** “into the table” while simultaneously exerting pressure **AGAINST** the fence while pushing the stock forward.
13. Normally, when you are ripping wood, the scrap wood must be to the outside of the blade to reduce the possibility of a kickback.
14. **ALWAYS CONTROL THE WOOD BETWEEN THE FENCE AND THE BLADE TO PREVENT KICKBACK.**
15. Your fingers must be kept clear of the track of the saw, and your hands should never cross the saw line while the machine is in operation.
16. Arch your fingers when you are feeding instead of laying your hands flat to have better control of the wood.
17. Reaching over the saw blade or passing wood over the saw blade while the saw is in motion is extremely dangerous and therefore forbidden.
18. When you are crosscutting a number of pieces to the same length a clearance block (at least 3/4” thick) should be fastened to the rip fence at least 6” in front of the saw blade. Have the shop technician check your setup.
19. When helping to cut large pieces of wood, the helper must remember their only purpose is to support the stock. **DO NOT** pull on the piece! The operator pushes the stock through the machine. **The person helping should “be a table” and not attempt to control or take control of the operation whatsoever.**
20. If it is necessary to clear the table of scraps of lumber, make sure the blade is stopped or completely lowered. Use a brush, push stick, or scrap of stock to clear scrap. **Do not use your hands.**
21. Unless prior approvals have been obtained, the shop technician must inspect all special set-ups before the power is turned on.

22. Backing the wood away from the blade while the saw is running will throw the wood toward you. If it is necessary to remove the wood, always stop the saw first and wait until the saw blade comes to a complete stop.
23. Work should always be held firmly against the fence or miter gauge.
24. The fence is used for ripping only.
25. The miter gauge is used for crosscutting only.
26. The fence and miter gauge are never used both at the same time for through cuts, except when multiple cuts of the same size are made, and this is accomplished by means of a clearance block and must be approved by the shop technician.
27. Never use the fence as a cut-off gauge when crosscutting (The off-cuts WILL kickback).
28. Stock should always have a jointed or surfaced face and/or edge against the table, miter gauge, or fence. Similarly stated, a rough, warped or uneven surface should **NEVER** be placed against the table, fence, jig or miter gauge. **Doing so can cause a kickback.**
29. Stock should be free of knots, splits, metal, defects, or warp. Tight knots are OK but care must be taken when cutting through knots.
30. Push stock completely through and clear of blade when ripping or a kickback can result. Stock must completely clear the back of the blade before letting go.

***The SawStop table saw has a built-in sensor that automatically stops and drops the saw blade when contact with skin is detected to prevent injury. When the main power switch is turned on, the sensing circuitry self-calibrates and will indicate it is safe to operate by displaying a “green” monitoring light. The SawStop will save your fingers from being cut off due to a mistake, so most care is directed towards preventing kickback. A CUT PERFORMED FOLLOWING ALL THESE PROCEDURES WILL NEVER KICK BACK. If kickback occurs, the operator made a preventable error. The goal is not to stay out of the way of kickback (which is futile); the goal is to prevent kickback from ever happening by following all these safety procedures.**

DRILL PRESS SAFETY PROCEDURES



1. The DRILL PRESS can be used for drilling straight holes.
2. NEVER leave the chuck key in the chuck.
3. Insert the drill bit in the chuck properly and tighten it securely before starting the drill press.
4. **Remove chuck key before power is turned on.** If the chuck key is not removed it will be thrown out from the chuck at tremendous speed when the power is turned, which could cause injury to the operator or other individuals in the lab.
5. Use drill press vice or clamps whenever necessary to firmly secure the work.
6. Use a base block under the work to prevent the bit from contacting the metal table. This base block should be of 1/2" to 3/4" thickness and be approximately the size of the drill press table.
7. Keep hands a minimum **2" margin of safety** away from revolving bit.
8. Operate feed handle so that drill cuts evenly into work.
9. The drill bit should be backed out occasionally to clear shavings and cool the bit.
10. Ease up on feed pressure when drill begins to break through.
11. Back the drill out as soon as the hole is drilled.
12. When boring to depth, use the lock nut on depth adjustment.

- 13.** Stop the drill press before attempting to remove work.
- 14.** If work comes loose and is seized by the drill press, shut off power immediately if possible, without endangering yourself. If it is impossible to shut power off, move away from the machine and also move others away.
- 15.** Obtain approval from the shop technician for any special set-ups on the drill press before beginning the operation.

ROUTER TABLE SAFETY PROCEDURES



1. The ROUTER can be used to create an edge profile, cut joinery, or duplicate shapes.
2. Only use accessories that are specifically designed for operation in high-speed routers.
3. Always disconnect the plug from the electrical outlet before changing bits or making adjustments.
4. Make sure the bit is firmly secured in the chuck before starting work. Always leave 1/8" or so between the bottom of the router bit and the bottom of the chuck so it seats firmly.
5. Make sure the router motor is secured to the router base before the power is turned on.
6. When starting the router make sure the bit is **NOT** in contact with the work.
7. If not using the router table, hold the router firmly, when turning on the power, to overcome the starting torque of the motor.
8. Maintain a **MINIMUM 2" margin of safety**. Keep awareness of your fingertips and their proximity to the bit even after power is turned off until the bit comes to a complete stop.
9. Keep hands and loose clothing away from revolving bits. The bit will "climb"

anything it touches, including your body; a tiny lapse in awareness while using the router can result in serious and gruesome injury.

10. Operate router in proper direction: against cutter rotation.
11. Do not overload or “bog down” the speed of the router.
12. **Make several light cuts where large amounts of material are to be removed.**
13. Always make sure the bit is sharp. If unsure, check with the shop technician.
Never use a dull bit.
14. At least 1” of the router bit shank must be in the collet.
15. When using the handheld router, the work to be routed must be securely clamped or otherwise secured.
16. With the router unplugged, insert router bits fully into the collet and then withdraw them approximately 1/8” before tightening in the collet so bit is not bottomed out.

WOOD LATHE SAFETY PROCEDURES



1. Roll loose sleeves above elbows and remove or fasten any loose clothing.
2. Make sure the stock is free from checks, loose knots or other defects.
3. Make certain that all glued work is properly glued and dry.
4. Be sure stock is correctly mounted in lathe.
5. Clamp tool rest holder firmly.
6. Be certain tool rest is adjusted between 1/8" below center and center for most operations.
7. Make adjustments of tool rest only when lathe is at a dead stop.
8. WEAR FACE SHIELD AND SAFETY GLASSES.
9. Check sharpness of turning tools. Sharp tools permit greatest control. Dull tools are dangerous because they are hard to control and require too much pressure by the operator.
10. Start lathe at lowest speed when beginning operation, until stock is balanced and does not vibrate. Unbalanced stock may break apart or fly out of lathe at high speeds.

- 11.** Grasp turning tool firmly with both hands while cutting stock.
- 12.** Hold turning tool firmly against the tool rest.
- 13.** Keep hands away from stock while it is revolving.
- 14.** Use correct amount of tool pressure against stock.
- 15.** Stop lathe when using inside or outside calipers.
- 16.** Maintain the tool rest as close as reasonably possible to the stock, by making frequent adjustments, with machine at full stop.
- 17.** Concave cuts on a cylinder can be made with either a round nose tool or a gouge.
- 18.** Use only the gouge for roughing spindles to round shape. Do not use any other tools until the stock is round.
- 19.** Always revolve the lathe before turning on power to make certain that no wood strikes any part of the lathe.
- 20.** Remove tool rest when sanding and finishing.
- 21.** Sanding and polishing must be done on the underneath side of objects only.
- 22.** Students are required to demonstrate proficiency with spindle turning before attempting any face plate turning.

SPINDLE SANDER SAFETY PROCEDURES



1. The oscillating SPINDLE SANDER can be used to sand inside curves of stock. The spindle travels in a circular motion as well as oscillating up and down.
2. Keep fingers away from the abrasive surface on the sander using a **2” margin of safety**.
3. Always use the largest spindle that will do the job.
4. Always feed against the direction of spindle rotation.
5. Use the appropriate throat plate to leave the minimal opening around the spindle
6. Every component of the spindle sander has a “place to be” on the tool rack. Do not leave spindles, throat plates, etc. lying loose.
7. Notify the shop technician when spindles are excessively worn.
8. Work on the side of spindle that will allow as much dust as possible to enter the sawdust collector.
9. When removing or installing the sanding spindles, make absolutely certain that all wrenches are removed before turning on the power to machine. Failure to do so will result in the wrench flying out as well as damage to the machine.
10. The spindles need to be secured reasonably tight with the wrench provided, but care must be exercised to not over tighten.

DISC SANDER SAFETY PROCEDURES



1. The DISC SANDER can be used to sand outside curves and edges.
2. **This machine is for fine-tune sanding only, not heavy shaping.**
3. Draw your shape and use the *saws* to get within 1/8" of your line. Use the Disc Sander to sand the 1/8" or less up to your line.
4. The sander is to be used for edge sanding only. It is not a shaper or spindle sander. Do not sand the face of the wood or use the sander for major shaping.
5. Hold work securely and down against the table.
6. Always sand on the down travel side of the disc (left half of disc).
7. Keep fingers away from the abrasive surface on the sander keeping a **2" margin of safety.**
8. Sanding pieces less than 2" wide is dangerous. Hold small pieces in a wooden clamp.
9. Feed stock at a slow/light rate of feed and pressure. Avoid excessive pressure against the belt or disc.

EDGE BELT SANDER SAFETY PROCEDURES



1. The EDGE BELT SANDER can be used straighten the edge of large pieces of wood.
2. **This machine is for large pieces only. Sanding small or short pieces is dangerous, use a different sander.**
3. Draw your edge with a pencil and straight edge so you can sand up to the line.
4. Hold material firmly against the stops or table before applying slight pressure towards abrasive.
5. Keep fingers away from the abrasive surface on the sander keeping a **2" margin of safety.**
6. Sanding pieces less than 2" wide is dangerous. Use the disk or spindle sander for small pieces.
7. Feed stock at a slow/light rate of feed and pressure. Avoid excessive pressure against the belt or disc.
8. Make sure the belt is tracking properly and is not rubbing on any metal surface. Turn off the main power immediately and notify the shop technician if the belt is stuck or loose.

EQUIPMENT SPECIFIC SAFETY VIDEOS:

The following videos have been selected to demonstrate how each machine works and the safe way to use each specific machine.

BAND SAW

https://youtu.be/_i3IV4LdWBA

10 minutes

Notes: The instructor is standing to the side so you can see what's happening. You will generally stand in front of the machine to operate it.

MITER SAW

<https://youtu.be/FVpmjX1Djml>

15 minutes

Notes: Our miter saw is for WOOD only. NO METAL can be cut in the woodshop.

TABLE SAW

<https://youtu.be/hRygWpXXYJ4>

4 minutes

Notes: A rip cut is a cut along the length of the wood. The video starts with explaining a rip cut. Next it shows a cross cut and reminds you NEVER to use the rip fence to make a cross cut.

DRILL PRESS

<https://youtu.be/Nu9tYcld7ck>

7 minutes

Notes: The drill press in the wood shop is for WOOD only.

EDGE SANDER

https://youtu.be/KPywQzdiL_M

8 minutes