**Phase 1**

**General and Hand Tool Safety Training**

*Perkins Hall Wood Lab- School of Forest Resources (SFR)*

**These Lab Safety Policies and Procedures document explains the fundamental policies, procedures and safe work practices that all lab users must follow. All lab users must be provided a copy of these policies and procedures, review them, understand them and have an opportunity to ask questions about the content of this document. Once the review is complete, the user and Lab Manager must sign the form signifying that the fundamental lab user safety training and orientation has been completed. This training must be refreshed annually.**

**Documentation of completion will be provided to the lab user, copies of the documents showing completion will be maintained in the Lab by the Laboratory Manager.**

# TYPES OF LAB USERS

* ***Authorized person*** - an individual (either trainee or competent user) who after basic safety, basic lab safety, and relevant individual tool training is authorized to operate specific equipment by the lab manager.
* ***Trainee*** – is an authorized user that requires supervision in the operation of machine lab equipment.
* ***Competent user*** - is an authorized user that may, depending upon the operation being carried out, work without supervision and or without monitoring (but not alone). This person must have passed all safety trainings.
* ***Monitor*** – this is a competently trained person who is authorized to stop hazardous operations.
* ***Laboratory Manager*** - the laboratory manager is responsible for ensuring that all equipment users are trained, the equipment is in safe operating order and that the space is clean, reviews all wood shop activities planned for safety and/or unusual aspects, and that materials and supplies are available and used for approved activities.

It is highly important that you are aware of what your status and the status of others. Therefore we can better hold each other accountable for the safe and smooth operation of the lab. If you think that someone might not be authorized to use certain equipment then please ask if they are authorized. If they are not then please ask them to find a Lab Monitor and ask how they can become an authorized user.

# PHASES OF SAFETY CERTIFICATION

Because of the ***Yale incident*** (<http://www.cbsnews.com/news/yale-student-dies-in-chemistry-lab-accident>) all Universities have adopted a new ***Phased Safety Certification Program***. This program consists of 3 phases of certification and places an importance on a user’s ability to understand the level of danger that each class of machines contains.

**Phase 1 trainings: (\*required)**

**LEVEL 1:**

* General Safety & Hand tools (manual & power)\*

**LEVEL 2:**

**Phase 2 trainings: (must have completed phase 1 general safety & hand tools training first!)**

* Wood shop - Large Power tools (table saw, miter, band, planar, drill press, etc.)

**LEVEL 3:**

**Phase 3 trainings: (must have completed phase 1 general hand tools and phase 2 training first!)**

* CNC Milling

Individual lab managers or monitors are authorized to apply rules/procedures that are more stringent than those indicated below. No established rules/procedure may be less stringent than those detailed in this document. The lab rules must be conspicuously posted in the area.

# SFR LABORATORY POLICIES

1. Before being authorized to operate equipment (whether supervised or unsupervised), a prospective user must undergo and complete Phase 1, Basic Safety Training, Machine Lab General Safety (general) and specific equipment safety training (initially & with annual refreshers).
2. Users being trained require written authorization by the lab manager to operate under supervision specific equipment.
3. Competent users require written authorization by the lab manger/monitor to operate specific equipment without direct supervision while carrying out routine tasks. (Authorized competent users of industrial category equipment will be subject to monitoring by lab managers/monitor).
4. Non–routine tasks must undergo a hazard analysis and be approved by the lab manager prior to commencement of the operation.
5. The lab manager and trained faculty have full authority of the lab and its safe use, including the responsibility, authority and obligation to prohibit lab or tool access for the health and safety of users, others in the lab, or university property and equipment.
6. Equipment that has been tagged out of service or equipment that is damaged or does not appear to be operating normally **must not be used**.
7. No loose clothing may be worn when operating equipment this includes ties, scarves and loose sleeves. Open toed shoes, sneakers, shorts, and/or skirts are also prohibited.
8. Long hair, including beards, must be pulled back and secured and contained.
9. Jewelry that may cause a hazard when operating equipment may not be worn; this includes rings, necklaces, bracelets and watches.
10. Aisles, exits and emergency equipment must be kept clear at all times.
11. Safety Glasses must be worn at all times in the lab. Some operations and equipment may require additional PPE.
12. All guards and shields must be secured and in place prior to operating the equipment.
13. Compressed air must not be used to clean skin or clothing.
14. All equipment and safety issues or concerns must be reported immediately to the lab manager or monitor.
15. Working alone [The Buddy System]:
	1. Graduate and undergraduates and users under training must not work alone; and they must work during the official open hours of the lab. The lab manager or a monitor must be present at all times.
	2. Users of the lab & industrial machines category (Phases 2 & 3) must not work alone; the lab manager or a monitor must be present at all times.
	3. The normal operating procedure is that there should be at least two people present in the lab area when machine tools are being operated.
	4. If working alone is required, a written job hazard analysis must be carried out and standard operating procedures (SOP) put into effect that will eliminate or reduce the hazards associated with working alone. This SOP will be approved by the lab manager and kept on file.
16. Access to machine tools will be controlled to prevent after hours operation of equipment.
17. All equipment must be maintained and used in accordance with manufacturer’s recommendations and any statutory requirements. Equipment cannot be rigged to operate in a way that it was not intended.
18. No horseplay.
19. No food, beverages are allowed outside the designated area near the water fountain.
20. No tobacco products are allowed in the lab.
21. Stay alert! Watch what you are doing, and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or powerful medication. A moment of inattention while operating power tools may result in serious personal injury or even death. Do not disturb someone working; make sure they know you’re there.

PERSONAL PROTECTIVE EQUIPMENT

* ***Safety glasses*** must be worn AT ALL TIMES. **Your normal glasses are not safety glasses.**
* ***Face shields*** should be worn while using the lathe and are available for other operations.
* ***Hearing protection*** is also available and should be worn when using any power tool.
* Dust mask, hard toe shoes (composite or steel), or hearing protection must be used for appropriate conditions.

# TOOLS

1. Do not operate any machinery or equipment without prior authorization from the Lab Manager.
2. Authorization includes specific training by SFR staff about potential hazards, the proper operation of equipment, and the use of protective devices. The worker must also show proficiency on a piece of equipment prior to use and sign a training acknowledgment form.
3. Check with the Lab Manager for training schedules/procedures.
4. Follow tool specific rules for additional safety equipment (like gloves, footwear, or dust masks), or add additional safety equipment for your personal comfort.
5. Store projects and equipment when you finish each day; be sure to tag them with your name and the date. Do not store your projects in the lab unless authorized by the lab manager.
6. The wood lab should be picked up and swept BEFORE you leave, unless you have an agreement with another lab user or the lab manager.

# USE AND CARE OF TOOLS

1. Any damaged equipment ***must*** be reported immediately.
2. Use a push-stick to guide material through saws and jointers where there is the possibility of the operator’s fingers coming in contact with blades.
3. Know how to turn off a machine before you turn it on.
4. Do not disturb or talk to persons operating power machinery.
5. Do not allow yourself to be distracted by others talking to you or by your cell phone. Cell phones, mp3 players, and other ***personal electronic devices must not be used when working at any machine***. Loud music that distracts or affects communication is prohibited.
6. All guards and shields must be secured and in place prior to operating equipment.
7. Always stop the machine before making measurements or adjustments.
8. ***Do not place hand tools on machines***. Keep them in their assigned location or on a nearby bench.
9. Use clamps or other practical ways to secure and support the work piece to a stable platform. Holding the work by hand or against your body is unstable and may lead to loss of control.
10. Remove chuck keys immediately after using. Do not turn on machine with chuck key installed in the chuck. A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
11. ***Do not force a tool***. Use the correct tool for your application. The correct tool will do the job better and safer at the rate for which it is designed.
12. Do not use a power tool if the switch does not turn it on or off. Any tool that cannot be controlled with the switch is dangerous and must be repaired.
13. ***Disconnect the plug from the power source before*** cleaning, repairing, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
14. Maintain tools with care. Keep cutting tools sharp and clean. Properly maintained tools with sharp cutting edge are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools "Do not use" and give them to the Lab Manager or monitor immediately.
15. Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation. If damaged, give the tool to the lab manager or monitor. Many accidents are caused by poorly maintained tools.

# CLOTHING/ATTIRE

1. ***Wear appropriate clothing*** when working in the lab. During construction or painting, nice clothing can be stained or sometimes torn. If you don’t want it to get ruined, don’t wear it here.
2. ***Do not wear overly loose or tight (restrictive) clothing*** including ties, scarves, jewelry, baggy clothes, excessive fringe, loose sleeves, or clothing with drawstrings that may be caught in a machine.
3. ***Open toed shoes, sneakers or sandals, shorts, short pants, or skirts are prohibited.*** Try to wear boots or shoes better suited for working in a fabrication environment.
4. Long hair must be pulled back, secured, and contained; long beards must also be contained. Be aware of items dangling from your body.

# ELECTRICAL SAFETY

1. Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. ***Never remove the grounding prong or modify the plug in any way***. If the tools should malfunction electrically or break down, grounding provides a low resistance path to carry electricity away from the user.
2. Double Insulated tools are equipped with a polarized plug (one blade is wider than the other).This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact your manager or monitor. Do not change the plug in any way. Double insulation eliminates the need for the three wire grounded power cord and grounded power supply system.
3. ***Do not abuse the cord***. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords increase the risk of electric shock.

# WOOD LAB EMERGENCY PROCEDURES

1. Know what the ***Safety Data Sheets*** (SDS) are and where they are kept.
2. In case of fire, exit the building verbally warning others as you go. Congregate at designated rally points. Keep flammables in cabinet labeled “flammables”.
3. ***Report all injuries, no matter how slight, to the Lab Manager***.
4. Report all problems with machines to the Lab manager or monitor so machines can be locked out and tagged out if necessary. Repairs can’t be performed if technicians don’t know they exist.
5. Be familiar with the lab’s Lock-out-Tag-out procedures. Lock-out-Tag-out procedures utilize locks and tags with warning signs to warn users to not attempt to work with the machine. Don’t tamper with a machine that has been locked out or has a tag stating that the machine is out of order.
6. Damaged equipment, or equipment that does not appear to be operating normally, must not be used. Tag it as out of service and report the issue to Lab Manager or monitor. Immediately report all problems or concerns to the Lab Manager or a monitor.
7. ***The lab manager and the monitors have full authority*** over the lab and its safe use, including the responsibility, authority, and obligation to prohibit lab or tool access for the safety of an individual, others in the lab, or the equipment.
8. Avoid accidental starting. ***Be sure switch is in the off position before plugging in.*** Carrying tools with your finger on the switch or plugging in tools with the switch on invites accidents.
9. Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.

AFTER HOURS WORK

If you need to work in the Wood Lab outside of normal business hours (8a.m. through 4p.m., Monday through Friday), fill out the after-hours request form and provide it to the Lab Manager for written approval. Remember that no one can work in that labs alone and there must be a manager, technician, or monitor present when working in the labs.

List of Approved Emergency Procedures

FIRE

#### ONLY FIGHT A FIRE IF...

* You are authorized and trained to do so.
* Everyone has left or is leaving the building, and that the fire department has been called.
* The fire is contained to a small area and that it is not spreading.
* You have an unobstructed escape route if things go badly.
* The extinguisher is the right type for the fire.
* **You have been trained by the University in the hands-on use of an extinguisher within the last three years.**

#### NEVER FIGHT A FIRE IF...

* You don't know what is burning therefore, you might not know what type of extinguisher to use.
* You don't have the right type or large enough fire extinguisher.
* The fire is producing large amounts of smoke.
* Your instincts tell you not to or you are uncomfortable with the situation for any reason.
* You don't have an exit or means of escape at your back. In case the extinguisher malfunctions, or something unexpected happens you don't want to become trapped. Always keep an exit at your back.

Personal Injury Emergency Procedures

#### In the event that:

1. You are injured or come upon an injured person.
2. Encounter suspected blood or other bodily fluids. You shall:
* Assess the area for other potential hazards
* Inform the Lab Manager, or SFR Faculty.
* Call 911 (Cell phone call 581-4040) and inform them what has happened.
* If the victim is other than you, administer first aid only if you are currently certified and are using the proper personal protective equipment.
* If you see suspected blood or other bodily fluids and no victim, call Public Safety at 911 (Cell phone call 581-4040) and inform the dispatcher. Keep people away from the suspected bodily fluid (DO NOT attempt a cleanup on your own).
* The injured person should file an INCIDENT REPORT Workers’ Compensation: Employee Injuries & Illnesses (UM systems form).

Prevention/Follow-up

The lab manager will conduct periodic safety audits and develop a corrective plan to reduce the risk of hazards within the workspaces. Once an emergency situation has been mitigated, an incident investigation will be completed, and corrective measures will be implemented to prevent future recurrence of the problem.

Implementation and Maintenance

This plan will be reviewed, trained, and exercised when the plan is first implemented, whenever a new user is being initiated, when changes necessitate, or at least once a year. The training will consist of providing a copy of the Emergency Action Plan, explaining procedures, walking through an evacuation, and answering any questions the lab user has.

Annual evacuation drills may also be conducted. The person responsible for updating and training this Emergency Action Plan is the lab manager.

Further Information on Emergency Actions

Call University of Maine Department of Safety & Environmental Management at

581- 4055.

Incident Reporting

## Types of accidents to be reported

* An unplanned event that causes injury, illness, or property damage.
* A “Near Miss” an incident having the potential to do the above.

Both accidents and near misses are to be reported to the Lab Manager and/or Dept. of Safety & Environmental Management 581-4055.

# WHAT TO DO WHEN AN INCIDENT OCCURS

1. Don’t panic, and assess the situation.
2. If the injury is life threatening Call an Ambulance (911), if it is not life threatening call Cutler Health (581-4000) if the event takes place after Cutler Health Center's open hours (8am-5pm) take the person to the emergency room at the EMCC (Eastern Maine Medical Center) in Bangor.
3. The Lab Tech will record information on the incident log and fill out the **Tier 1 SEM Form** at the Safety & Environmental website: <http://sem.umaine.edu/forms/>
4. They will call SEM and report the incident then notify the lab manager (207) 659-6780.
5. If someone was hurt or something was damaged do to the malfunction of a machine or tool make sure that Lock Out / Tag Out procedures are followed and the machine or tool is remove from service.

Chemical Hygiene Plan

* Minimize chemical exposure – Try to utilize non-toxic materials. If a hazardous substance must be used be sure to follow guidelines and precautions provided on the container.
* Do not under underestimate risk – If the hazard risk of a substance is not known treat it as if it is hazardous.
* Chemicals must be accounted for – All chemicals must be pre-approved before being brought into the labs. You must have a copy of the SDS Sheet in hand and the chemicals are logged in the chemical storage file. The chemicals will be constantly checked and culled to keep chemical material from accruing in the labs.

PAINTS

It’s important for users to consider all of the chemicals used in the painting process when disposing of the chemicals. Paints and paint pigments can involve toxic materials and heavy metal compounds, such as lead, arsenic and chromium some of which may require PPE and may need to be disposed of properly through SEM. The application and handling of paints often involves solvents, such as thinners, mineral spirits or turpentine and rags. Solvent contaminated rags, if left for extended periods of time, can potentially start a fire. Please be sure that the solvent rag collection container is firmly closed after adding materials to it.

## Disposal of paints:

Latex – latex paint is water based and often thought to be nontoxic. However, trace amounts of formaldehyde, isocyanates and ammonia may be present so practice good safety techniques and use caution when applying. Some of the pigments used in latex paints may contain other metals such as copper and zinc that are not hazardous wastes, but are regulated for discharge in municipal waste waters. Latex paint and associated debris, if left to dry, may be discarded as solid waste in the regular trash because the paint is bound to a solid media. However, if large quantities of latex paint remain, consider reuse for making things like signs advertising student events on campus.

Acrylic, varnish and oil based paints – acrylic, varnish and oil based paints often containing flammable materials such as methanol, toluene, ketones and naphtha and heavy metals such as lead, cadmium, chromium and mercury in the pigments. If reusing the material for other projects is not practical, the acrylic, varnish or oil-based paints – no matter the quantity – must be managed as hazardous waste. These paints must be collected and managed as hazardous waste and submitted SEM for removal @ **581-4055**. These must be collected in a 5 gallon bucket (Labeled Paint and Paint Thinner Only) and always stored in the flammables cabinet. This will be collected by SEM when full.

Aerosols – aerosol paints and any other materials that are dispersed as an aerosol, typically contain flammable and/or toxic components such as propane, isobutene, or dimethyl ether. Used aerosols must be collected and managed as hazardous waste and submitted SEM for removal @ 581-4055. Please mark as waste and place in the flammables cabinet. Please refer to our hazardous waste guidelines for further guidance.

An important safety note regarding aerosols:

* Since aerosol cans are under pressure, puncturing the container or altering the dispenser may result in physical harm and or injury even if they are empty, trace materials inside the can still present a hazard.
* Do not attempt to puncture or crush aerosol cans.
* Please affix the original container cap to the aerosol can or remove the push button knob prior to collecting ***multiple*** cans in a waste collection container for disposal.

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## Disposal of paint related materials:

* ***Rags contaminated with solvents*** – rags, lab towels, paper towels contaminated with paint thinner, mineral spirits must be collected and managed as hazardous waste and submitted SEM for removal @ 581-4055. Please refer to our hazardous waste guidelines for further guidance.
	+ All rag collection cans must be collected in one of the provided safety cans.
	+ The rag collection cans must container a plastic liner.
	+ The rag collection cans must be stored entirely closed when not in active use.
	+ Rags must not be purposely left out to “dry” &/or evaporate the contents.
* ***Solvents and Thinners***– solvents, paint thinners, mineral spirits and turpentine are highly flammable materials. After the useful life of the solvent &/or thinner, it must be collected and managed as hazardous waste and submitted SEM for removal @ 581-4055. Please refer to our hazardous waste guidelines for further guidance.
* The solvent and thinner containers must be tightly closed when not in active use.
* Solvent and thinner containers must not be left open to “evaporate”.
* Paint contaminated solvents and thinners are a hazardous waste and must not be poured down the drain.

The lab areas that have been provided with a drum for solvent and thinner found in the flammables cabinet. The following must be abided by for solvent and thinner collection:

* Funnels are not strainers. Strain your solid paint materials prior to pouring the solvents and thinners into the drum so as to not clog the safety funnel.
* When the drum is full, call SEM for HAZCOM pickup and removal @ 581-4055.
* Do not move the solvent and thinner drum from the current location.

If you have any questions as to how to dispose of your paint related materials, please consult your Lab Technician, Facility Faculty, or Safety & Environmental Management at 581-4055.

# The Tour of the Labs

The Lab Manager and/or Monitor will take you through the labs and show you where important safety resources can be found. After the tour of the facility you must be able to identify where these items are located:

* First Aid Kit
* Fire Extinguisher
* Fire Exit
* Fire Alarm
* MSDS Sheet Folder
* Chemical Log
* HMIS Labels
* SFR Safety Folder
* Flammables Cabinet
* Oily Rags Can
* Emergency Electrical Cutoff Switch

If you have any questions about the Phase 1 user responsibilities or the implementation of the SFR Policies please ask. We will be happy to help clarify any of the part of this training

 Power and Hand-tool Safety

The safe use of tools is important so be aware of anything, from how a person uses a tool to the condition of the tool or the workspace.

* Choose the correct tool for the job
* Keep the labs clean of debris
* Wear the appropriate clothing and Personal Protective Equipment

# Personal Protection

1. Use the right Personal Protective Equipment for instance: goggles, earplugs and dust masks.
2. Wearing gloves is prohibited when working with most tools.
3. Wear the appropriate clothing, sandals, sneakers; open-toed shoes are **prohibited**. Do not wear loose-fitting clothes and jewelry that might become entangled in a power tool.
4. No drinking or using drugs while at the labs. This includes strong prescription medications.

# Before Using Power Tools

1. Try holding the tool and envision how you will use it to complete the task.
2. Make sure you have enough workspace that is free of other objects allowing you to move freely about.
3. The weight and the size of the tool should not be more than you can handle.
4. Do not use a tool when standing in an uncomfortable or off-balanced position.
5. Ask a lab manager or monitor whether you should use a guard to prevent accidents from happening.
6. Familiarize yourself with the owner’s manual. It will tell you everything you need to know.
7. Be sure to get authorization to use any tool in the labs. If you are not sure whether you are authorized then you are probably not, please ask for help and seek out training.
8. The tool should be in good working order before you use it. All nuts and bolts should fit tightly and the cord should not be frayed or entangled. If a tool is broken do not use it and report the condition to the lab manager or monitor.
9. Only bring authorized tools into the labs. Check with a lab tech before bringing a tool into the labs. We are not responsible incidents by tools that were not authorized.

# Tool Maintenance

1. If working with powered equipment turn the equipment off and unplug it before cleaning, repairing it, or exchanging parts.
2. Do not yank on a cord to unplug a tool you may unplug tools by pulling directly on the plug. Jerking a cord may cause the wires to break or fail.
3. Always clean and put the tools back in their designated spaces when you are done with them.
4. Keep blades sharp, dull blades cause more workplace accidents than sharp blades.
5. Never set a tool down so that the blade is resting on a hard surface (i.e. metal, concrete or stone).

# Work Areas

1. In the shop we ask that you keep the lab clean, clean labs are reduce workplace accidents.
2. Do not leave solvents or flammable materials lying around. Make sure they are properly stored and disposed of.
3. If water spilled or is on the floor clean it up immediately so as to prevent slipping or electrocution if wires are near.
4. Use the correct wiring for power tools. Electrical cords should have the correct amperage rating and electrical outlets should not be over capacity because of daisy chained power strips or multi-plug adapters.
5. Never tear off a ground pole to use an extension cord or power tool. If you see a tool or cord that had the ground torn off please report the problem to the Lab Manager or Monitor immediately.
6. Do not place tools on the rung or the top of a ladder. Place them on more secure places or hold on to them. A tool that falls from a ladder or scaffold can seriously injure a by-stander or damage the tool.
7. Know where the first aid kit, emergency telephone, flammables cabinet, fire alarm, and safety folder are located.
8. Oily and greasy rags should be kept in a specified flammables can next to the flammables cabinet
9. Always pay attention to the tool. If you are distracted by someone or something turn off or stop using the tool.
10. Cutting tools are dangerous! If a saw becomes jammed turn it off and get the assistance of the lab manager or monitor.
11. Let powered saws reach full speed before cutting into material.
12. Always support and clamp the material never hold the material in the air with your hands while trying to cut it.

# Safety for Specific Tools & Power Tools

1. **Drills**
2. Use only good quality bits.
3. Select the proper size and type of bit for the job.
4. Make sure the bit is sharp and not damaged.
5. Do not over-force the drill into hard material as the bit might break. If the speed can be varied, operate the drill at the correct speed, and do not lock the switch of a hand-held drill in the on position.
6. **Hand-Held Circular Saws** -
7. Do not work in wet areas unless standing on a dry surface and the saw is properly grounded.
8. Do not clamp or wedge the guard in the open position. Keep your finger off the trigger when carrying the saw. Do not cut the power cord.
9. Wait until the blade stops before laying down the saw.
10. When finished, unplug the saw and put it out of the reach of children.
11. **Saber Saws** - (i.e. jig saws)
12. Select the proper blade for the job. Make sure it is sharp, undamaged and securely tightened in place.
13. Do not turn on the saw when the blade is in contact with the workpiece.
14. Hold the saw firmly with one hand and steady the work with the other.
15. Keep your hand and other objects clear of the blade.
16. **Blades**
17. All blades including chisels, whittling knives, and planes should be used in a way that cuts away from your body and/or hand.
18. Always think about where the blade might go if it slips or breaks.
19. Workpieces should be clamped down or secured tightly with a firm grip.
20. Do not set blades down in a way that the blade rests on a hard surface.
21. Always keep the blade sharp. Ask for assistance from a Lab Manager or Monitor on how to sharpen it.