General Shop Safety

- ***NMCC Machine Shop Requirements for Shop Safety***

  This unit is designed to acquaint new students with some common shop hazards. Our goal is to prevent injuries to the people who use this facility. As you view the audiovisuals and read the related Safety Rules, you should realize that a major part of shop safety is based upon common sense and thinking ahead. It is an accepted fact that forethought and the elimination of carelessness can avoid virtually all shop accidents.

  Before you make a move, think about what might occur. **THINK AHEAD**. Develop the habit of never trusting mechanical devices. Never place yourself in a position where you could be hurt if something mechanical failed. Your hands are especially vulnerable. Always be on the watch for possible pinch points that could develop. Give your undivided attention and thought to the task before you. Daydreaming or talking with a friend reduces your attention on the job.

  When you actually begin working on machine tools, you will be reading safety considerations related to each specific machine. You are expected to review those sections, which apply.

  Maintaining shop safety is a full-time job. You can never relax in your accident prevention habits. Remember that safety is a habit and it must be practiced until it is automatic. If you ever encounter a situation you're not sure of with regard to safety, consult with an instructor.

  - ***THINK AHEAD!***
  - ***USE COMMON SENSE!***
  - ***PAY ATTENTION TO WHAT YOU'RE DOING!***
  - ***NEVER RELAX AGAINST ACCIDENTS!***

General Shop Safety

- ***Maine Safety Works Video***
    1. High Impact Metal Working Safety #383

- ***Maine Safety Works Video***
    1. Personal Protective Equipment #199

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- ***Safety Rules***
  1. Always wear SAFETY GLASSES in the shop.
  2. Do not set up or operate any machinery unless an instructor is in the shop.
  3. Do not operate any machine unless authorized to do so by an instructor or under an instructor's supervision.
  4. Use the proper tool for the job. Many cuts in the shop occur because a wrench slips and a hand hits a sharp cutting tool.
  5. Check tools before use to assure they are safe to use.
  6. Do not leave tools or work on the table of a machine even if the machine is not running. Tools or work may fall off and cause a toe or foot injury.
  7. Put tools away when not in use.
  8. Place all scrap pieces in the correct containers.
  9. Never handle chips with your hands or fingers. Chips are extremely sharp and can easily cause cuts.
  10. Use a brush to remove chips from equipment – not hands, fingers or rags.
  11. Never wear gloves or use rags to clean the work piece or any part of a machine that is running. Rotating tools or parts can grab gloves and rags and pull you into the machine.
  12. Never use compressed air to clean any machine.
  13. Never use compressed air to clean your clothes or yourself.
  14. If using compressed air to clean a part, point the air hose down and away from yourself and others.
  15. Do not run in the shop. There should be no "fooling around" in the shop at any time.
  16. Get first aid immediately for any injury.
  17. Get help for handling large, long or heavy pieces of material or machine attachments.
  18. Follow safe lifting practices; lift with your leg muscles not your back. If you do not know how to lift safely, ask an instructor to show you.
  19. Be sure you have sufficient light to see clearly.
  20. Aisles should be clear at all times to avoid tripping or other accidents.
  21. Store materials in such a way that they cannot become tripping hazards.
  22. Keep the floor free of oil, grease or any other type of liquid. Clean up spilled liquids immediately – they are slipping hazards.
  23. Loose clothing or long sleeves should not be worn in the shop. Machines can easily grab loose clothing in rotating parts.
  24. All set-screws should be of the flush or recessed type. If they are not, move with caution when near them. Projecting set-screws are very dangerous.
  25. Do not walk behind a person operating a machine; you may bump him/her by accident or startle them and cause an accident.

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- ***General Machine Safety Considerations***
    1. Be sure that all machines have effective and properly working guards and covers and that they are always in place when machines are operating.
    2. Replace guards immediately after any repairs.
    3. Do not attempt to oil, clean, adjust or repair any machine while it is running. Stop the machine and lock the power switch in the "OFF" position.
    4. Do not operate any machine unless authorized to do so by the instructor or under the instructor's supervision.
    5. Do not set up or operate machinery when an instructor is not in the shop.
    6. Even after the power is off, do not leave the machine until it has stopped running. Someone else may not notice that it is still in motion and be injured. Do not leave a machine until it has come to a complete stop.
    7. Do not try to stop the machine with your hands or body.
    8. Check tools before use to assure they are safe to use.
    9. Always see that work and cutting tools on any machine are clamped securely before starting to work.
    10. Only one person should operate the machine or switches.
    11. Do not lean against the machine(s).
    12. Concentrate on the work and do not talk unnecessarily while operating the machine.
    13. Do not talk to others when they are operating a machine. A distraction may lead to an injury.
    14. Always remove gloves before turning on or operating any machine. If material is rough or sharp and gloves must be worn, place or handle material with the machine turned off.
    15. Stop the machine tool to make speed and feed changes that require the shifting of a gear lever.
    16. Always use correct speeds and feeds. A broken tool becomes a hazard and can cause great personal injury.
    17. Make sure the machine is "OFF" before making any adjustments or repairs.

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- ***Housekeeping***
    1. Aisles should be clear at all times to avoid tripping or other accidents.
    2. Keep floors free of oil, grease or any other type of liquid. Clean up spilled liquids immediately – they are slipping hazards.
    3. Keep the floor clear of metal chips and scrap pieces. Scrap pieces are tripping hazards and chips may cut through and could and injure the foot.
    4. Place all scrap pieces in the correct containers.
    5. Store materials in such a way that they cannot become tripping hazards.
    6. Put tools away when not in use.

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- ***Clothing and Safety Equipment for the Machine Shop***
    1. Safety glasses with side shields or goggles ***must be worn*** at all times while working in the shop. Approved eye protection will be labeled as meeting ANSI Z87 safety standard. Ordinary prescription glasses do not qualify as approved eye protection and must be supplemented by goggles or safety glasses designed to fit over glasses. Face shields are not approved primary eye protection and should only be worn over approved safety glasses or goggles. It is your responsibility to provide your own eye protection. Do not expect to work in the shop facilities if you do not have your own eye protection.
    2. Safety shoes ***must be worn*** at all times while working in the shop. Approved safety shoes will be labeled as meeting ANSI Z41/Class 75/1991 safety standard. Do not expect to work in the shop facilities if you do not have your own safety shoes.
    3. Know the location of safety equipment. Fire extinguishers, eyewash stations, telephones, material safety data sheet file, etc. are only useful if you know where they are.
    4. Wear your hair suitable for the trade. Long hair can be a hazard around moving machinery. It can get caught in moving parts and pull the employee into the hazardous area. Restrain long hair in a hair net or style it to ensure that it will not get caught in the machinery. You may protect long hair by:
        - Tying it neatly behind your head
        - Wearing a hair net
        - Wearing a suitable hat or welding cap
    5. Wear clothing appropriate for the job – DO NOT WEAR:
        - Shorts or cutoffs
        - Loose clothing, torn clothing or long sleeves.
        - Rings, watches, bracelets or other jewelry that could get caught in moving machinery

General Shop Safety

- ***Lockout/Tagout***

  Lockout/Tagout is the common name for a process of "Control of Hazardous Energy" as established by the Occupational Safety and Health Administration (OSHA) under Federal Registry 29 CFR 1910.147. The purpose of lockout/tagout is to prevent injury to persons during the repair, maintenance, inspection and adjustment of equipment by controlling all energy sources used, stored or produced by the equipment.

  To lockout a machine or piece of equipment, all energy sources are turned off or disconnected, stored energy is released or restrained and a lock is applied either directly to the disconnects of each energy source or through a lockout device affixed to each energy control device, so that re-energization cannot occur.

  To tag out a machine or piece of equipment, all energy sources are turned off or disconnected, stored energy is released or restrained and a warning tag, such as "Do Not Operate" is applied to the disconnects of each energy source, so that re-energization cannot occur.

  Lockout/Tagout protects you from these energy sources, such as moving machinery, and stored energy such as electrical, chemical, thermal, hydraulic, gravitational and pneumatic.

  - ***Rules for acceptable lockout/tagout procedures:***
    1. Each authorized student is issued separate locks and tags.
    2. Locks and tags are standardized.
    3. Use locks and tags only for LOTO.
    4. Locks and tags have information about who placed them.
    5. Only the person who placed the lock may remove it.
    6. Authorized (qualified) students are the only people allowed to lock and tag out equipment or machinery.
    7. Know the equipment and energy sources.
    8. Notify all effected personnel that the machinery, equipment or process will be out of service.
    9. Conduct a normal shutdown. An orderly shutdown will be used to avoid any additional or increased hazards to personnel as a result of equipment de-energization.
    10. Machine or equipment isolation – place all controls in "OFF" position.
    11. Place lockout/tagout device so that it will hold the energy isolating devices from the "SAFE" or "OFF" position.

  - Typical minimal lockout procedures - 1910.147 App A.url

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- ***Hazardous Materials***

  Federal Law dictates that employers must provide information to their employees about hazardous materials and chemicals that they may be exposed to in the workplace. The vehicle for that information is the Material Safety Data Sheet (MSDS). While there is no specified format for the MSDS, OSHA has developed a non-mandatory format, OSHA Form 174, which may be used by chemical manufacturers and importers to comply with OSHA's Hazard Communication Standard.

  Here's a blank OSHA Form 174 that shows you what kind of information you need to get from your suppliers and to convey to your employees regarding the chemicals, including the identity, characteristics, and hazard data.

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Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(as Used on Label and List)*	*Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.*

Section I

Manufacturer's name	Emergency Telephone Number
Address *(Number, Street, City, State and ZIP Code)*	Telephone Number for Information
	Date Prepared
	Signature of Preparer *(optional)*

Section II—Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)

Section III—Physical/Chemical Characteristics

Boiling Point		Specific Gravity (H_20 = 1)	
Vapor Pressure (mm Hg)		Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	

Solubility in Water

Appearance and Odor

Section IV—Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

(Reproduce locally) OSHA 174 Sept. 1985

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Section V—Reactivity Data			
Stability	Unstable		Conditions to Avoid
	Stable		
Incompatibility *(Materials to Avoid)*			
Hazardous Decomposition or Byproducts			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur		

Section VI—Health Hazard Data			
Route(s) of Entry	Inhalation?	Skin?	Ingestion?
Health Hazards *(Acute and Chronic)*			
Carcinogenicity	NTP?	IARC Monographs?	OSHA Regulated?
Signs and Symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure			
Emergency and First Aid Procedures			

Section VII—Precautions for Safe Handling and Use
Steps to Be Taken in Case Material Is Released or Spilled
Waste Disposal Method
Precautions to Be Taken in Handling and Storing
Other Precautions

Section VII—Control Measures		
Respiratory Protection *(Specify Type)*		
Ventilation	Local Exhaust	Special
	Mechanical *(General)*	Other
Protective Gloves		Eye Protection
Other Protective Clothing or Equipment		
Work/Hygienic Practices		