

**MECHANICAL & CIVIL ENGINEERING DEPARTMENT  
UNIVERSITY OF EVANSVILLE**

**LABORATORY  
SAFETY**

There are methods of performing work in the Bowen Engineering and Annex Laboratories, which common sense and experience have shown to be essential for the safety and convenience of individuals and design teams. Many of these practices and procedures are outlined below and students must become familiar with them before they can work in the shop and any engineering labs.

**GENERAL SAFETY**

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- Wear approved eye protection when operating machinery and power tools.
- Do not eat or drink in the laboratory.
- Wear closed toe shoes and appropriate clothing.
- Store books, backpacks, jackets or other items in areas designated by the instructor or technician.
- Don't run, push or surprise other students. No horse play will be tolerated.
- Keep drawers and cabinet doors closed when not in use.
- Treat all equipment with respect, and do not operate any equipment until you have been instructed on safety risks by the faculty or staff.
- Know the location of safety equipment and first aid supplies.
- Clean up all spills immediately.
- Make sure you understand the use of unfamiliar equipment or procedures before beginning work.
- Keep your work area as clean and clear as possible.

**SHOP SAFETY**

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- Think safety first! Use the buddy system; no one is allowed to use the shop alone.
- Wear approved eye protection at all times.
- Approved ear protection is recommended when using hand grinders. Do not wear audio headphones in the shop.
- Leather shoes or boots with steel toes are recommended. No open toed shoes or sandals are allowed in the shop.
- Do not wear loose clothing. Cotton clothes are best to wear.
- Remove all jewelry and tie back long hair.
- Do not operate any machine equipment unless you have been instructed on its proper use and the safety risks involved with the machining operation.

## SHOP SAFETY CON'T

- Do not leave any machinery or power tools running and unattended.
- Clean up metal shavings, oil, etc. from machine tools after use; pick up after yourself and return tools to their proper storage area.
- Tobacco and alcohol use is strictly prohibited in the shop and laboratories. Do not operate machinery while under the influence of alcohol or drugs (Violation of University Policy).
- Follow safety procedure when welding:
  - Never use welding equipment without proper gloves, eye protection, and protective clothing.
  - Never use welding equipment without the approval of the engineering technician.
  - Wear proper eye protection at all times.
- Note: Mr. Ottis Putler is the shop coordinator and Bowen Engineering Laboratory Technician. His permission is required before using or removing equipment, materials or hand tools in the shop or any mechanical/civil engineering laboratory. Violation of any safety rule may result in being barred from the machine shop or engineering laboratories.

## CHEMICAL SAFETY

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- Read safety warnings on labels and in experimental procedures.
- Do not taste or unnecessarily smell chemicals, solvents or other liquids.
- Never hold a container above eye level when pouring a liquid.
- Never heat a liquid or any specimen in a closed system.
- Never add solid materials to a hot liquid.
- Check glassware for cracks before using.
- Turn off all hot plates and sand baths when not in use.
- Know the location of the shower and eye wash fountain on the second floor.
- Keep containers closed.
- Wash your hands thoroughly at the end of your lab work.
- Set up fans to ventilate all laboratory rooms when using paints, solvents and other volatile chemicals.

## WASTE DISPOSAL

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- Dispose of all paper trash in wastebaskets, unless otherwise directed.
- Dispose of all broken glass in the glass recycle box in the shop.
- Use only WATER-SOLUBLE material in sinks. Flush materials with plenty of water.
- Discard waste solids (soil samples, concrete materials, etc.) in appropriate waste containers in the Geotech Lab and Concrete Lab.
- Chemical Substances to be discarded:
  1. Label with:
    - a. Name of chemical substance
    - b. Concentration of substance
    - c. Expected or known characteristics making it hazardous
    - d. Contact person for questions
  2. Store on the shelf marked "Discarded Chemical Waste" in the Sheet Metal Room (KC193 inside machine shop) until they are picked up to be taken to the centralized hazardous waste storage
- Aerosol cans to be discarded:
  1. Store in containers marked "Used Aerosol Cans" in the Engineering Annex and the Bowen Labs machine shop.
  2. Containers will be emptied when full or at least once per year and the contents taken to the central hazardous waste storage location for disposal.
- Used oil:
  1. Used oil from the Bowen Labs and the Engineering Annex should be added to the 5 gallon container in the Bowen Labs machine shop marked "Used Oil".
  2. The container will be taken to a local oil recycling center when full.
- Do not place paper, glass, etc. in sinks.
- Immediately report mercury spills (thermometer and manometer breakage) to Mr. Putler or an ME/CE faculty member. Do not attempt to clean-up mercury.

## **GENERAL HOUSEKEEPING**

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- Clean your work area. You are not finished in the lab until you have cleaned your work area.
- Return all tools to toolboxes.
- Put all equipment back in cabinets, or on shelves. **LOOK IN THE SINK.** Make sure no tools, equipment, paper towels, waste material, etc. are left in the sink.
- Close all air and vacuum valves.
- Turn off all pumps, power tools, electrical equipment, and instruments you have used.

## **LABORATORY ETIQUETTE AND RESPONSIBILITIES**

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You are sharing workspace with other students. It is important that you take responsibility for your share of the general upkeep of the laboratory. To do this you must **FOLLOW ALL RULES FOR LABORATORY SAFETY and PROPER HOUSEKEEPING.**

## HAZARD COMMUNICATION

### Policy

It is the policy of the University of Evansville (UE) to ensure that the hazards of all chemicals, equipment, procedures and experiments are identified and information concerning these hazards is transmitted to employees and students to provide for their safety and health protection.

This Hazard Communication Program is authorized by UE. It is implemented pursuant to Title 29 of the U.S. Code of Federal Regulations, Part 1910, subpart 1200.

The UE Engineering Department Hazard Communication Program has been developed to:

- Inform UE employees and students of the hazards associated with chemicals in the Engineering Department.
- Ensure safe use, handling and disposal of hazardous chemicals.
- Comply with the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (29 CFR 1910.1200).

The Engineering Department has designated the following departmental Hazard Communication Program Administrators to maintain this Program:

**Anita Long**  
**Ottis Putler**

**Phone: 488-2652**  
**Phone: 488-2292**

The Hazard Communication Program for the Engineering Department is available through the above mentioned Program Administrators.

### Material Safety Data Sheets

One of the key elements of the Hazard Communication Program are Material Safety Data Sheets (MSDS). A MSDS is a document prepared by the chemical manufacturer and documents important information for users about that chemical. The Hazard Communication Program requires users to have a MSDS on file for all chemicals present. MSDS's may differ somewhat in format and content, however all should contain the following:

1. Substance identification: Names, synonyms, manufacturer contact information, and index numbers.
2. List of active and inert ingredients: Components and contaminants.

3. Exposure limits: TLV (threshold limit values), PEL (permissible exposure limits), etc.
4. Physical data: Boiling, melting points, vapor pressure, evaporation rate, specific gravity or density, water solubility, physical description.
5. Fire and explosion data: LEL (lower explosive limit), flashpoint, flammability, class of hazardous atmosphere, firefighting media and methods, including fire extinguishers, etc.
6. Transportation requirements, if any.
7. Toxicity and health hazard data: Including target organ, specific acute and chronic health effects, potential cancer risk, first aid and emergency medicine.
8. Storage and disposal: Including reporting requirements.
9. Spill and emergency response procedures.
10. Measures to protect employees including personal protective equipment, safety shower and eyewash, etc.

For the Engineering Department MSDS's are kept in marked binders, preceded by an inventory of all the MSDS's contained in that binder. The MSDS binders are located as follows:

**Outside Room 188 in Bowen Lab. Building**  
**Outside Room 289 in Bowen Lab. Building**  
**Lincoln Annex**

### **Labeling**

An other important element of the Hazard Communication Program has to do with labeling. Proper labeling is key in effectively communicating regarding the contents of a container and it's hazards. Therefore, the following procedure has to be followed to assure safe handling of primary and secondary containers:

#### **Primary container label procedure**

1. When chemicals are received, check all containers to ensure that the product label is attached.
2. If a chemical product is shipped without a label, contact the supplier immediately to request labels or to arrange return of the chemical. Do not use the chemical until proper labels have arrived and have been permanently affixed to the primary containers.

#### **Secondary containers**

A secondary container is any container other than the one in which the chemical was received from the supplier. Secondary container labels will contain the same information as labels for primary containers. All labeling information can be obtained from the original container, or the MSDS for the product. Label secondary containers if:

- More than one employee or student uses the container.
- The container is used longer than one class/shift or left unattended in the work area.

It is not necessary to label the secondary container if:

- one employee or student uses the chemical without exposing others, **AND**
- returns the contents to the original container or disposes of the rest of it prior to the end of a work session

**NOTE:** If you have unlabeled or unidentified containers with chemicals please contact the Manager, Risk and Environmental Management for assistance.

DO NOT bring chemicals onto UE property from outside sources for personal use.

**SAFETY CODE**

**MECHANICAL & CIVIL ENGINEERING DEPARTMENT  
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***Safety Code for Bowen Engineering Laboratories***

**I have read the rules for laboratory safety and conduct. I will abide by these rules as I work in the shop and/or laboratory. I realize that my failure to adhere to these safety rules will result in my dismissal from the laboratory.**

Name \_\_\_\_\_  
(PLEASE PRINT)

Lab Number & Section \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

**TURN IN THIS SIGNED FORM TO YOUR INSTRUCTOR**