

North Dakota State University

Laboratory Equipment Operation & Maintenance

I. Introduction

Each laboratory and or department may have or require more job specific rules and regulations - they will take priority to those listed below. These guidelines are applicable to all research, teaching, and academic laboratories.

II. Purpose

The purpose of the manual is to promote safety awareness and encourage safe work practices in the laboratory. These guidelines shall serve as a reminder of things you can do to work more safely.

III. Goals

The goal is to limit occupational exposure to injury or death when working in the lab, with lab equipment and during operations and maintenance.

IV. Procedures

A. Awareness

- Label all storage areas, refrigerators, etc., appropriately and keep all chemicals in properly labeled containers.
- Be alert to unsafe conditions and actions, and call attention to them so that corrections can be made as soon as possible. Report all spills and accidents/incidents to the Safety Office immediately.
- **Near Miss Reports** shall be filed with the supervisor for documentation and corrective action.
- Pour concentrated solutions into less concentrated solutions to avoid violent reactions.
- Be familiar with the appropriate measures you should take when you or someone in your lab is working with or is exposed to a hazardous chemical, situation, or incident.
- Ensure that all laboratory personnel, including service and custodial staff and visitors understand the chemical and biological dangers associated with the lab.

B. Personal Safety

- Restrict laboratory access and keep doors locked when the laboratory is unattended.

- Use fume hoods whenever possible.
- Keep exposed skin covered. Ensure that all personnel, students, and visitors wear protective clothing such as lab coats, gloves and safety glasses. Remove lab coats or gowns before leaving the laboratory; never wear lab clothing into eating facilities.
- Avoid eating, drinking, smoking, storage of food and food utensils, application of cosmetics or lip balm and insertion or removal of contact lenses in the laboratory.
- Restrain long hair. Avoid wearing loose clothing, or jewelry, shorts and open-toed shoes or sandals to prevent injury or incident near open flames and near unguarded equipment.
- Observe “Universal Precautions” when collecting, processing, storing, shipping or transporting blood or body fluids. Assume all specimens are infected with bloodborne pathogens.
- Carry out procedures so as to minimize risks of splashes, spills and aerosols.
- Refrain from pipetting by mouth
- Use hypodermic needles only when absolutely necessary. Do not bend, break, shear or recap used needles.
- Wash hands after handling infectious material (even when gloves have been worn) and before leaving the laboratory.
- Decontaminate all contaminated materials before reuse or disposal. Dispose of all waste in the designated waste containers.
- Decontaminate laboratory surface following any spills and at the end of the day.

C. Fire Prevention

- Be aware of ignition sources in the laboratory area (open flames, heat, electrical equipment, etc.).
- Purchase and store flammable reagents in the smallest quantities available and in appropriate storage facilities, cabinets, or cans.
- Do not store incompatible reagents together (acids with flammables).

- Do not store ethers for extended periods of time as explosive peroxides could form.
- Make sure all electrical cords are in good condition. All electrical outlets should be grounded and should accommodate a 3-pronged plug.
- Keep the facility clean and free of clutter. Ensure that emergency safety devices are easily accessible and in working order. i.e./fire extinguishers, eyewashes, goggles

D. Housekeeping

- All equipment should be inspected before use.
- If experiments are to be continued unattended overnight, place a note next to the experimental apparatus indicating the chemicals involved, your name, and a number where you can be reached in case of an emergency. Avoid carrying out experimental laboratory work in an unoccupied building.
- Keep the laboratory floor dry at all times. Immediately attend to spills of chemicals/water and notify other lab workers of potential slipping hazards.
- All machinery and equipment under repair and adjustments should be properly tagged prior to servicing. All service work shall be done by authorized personnel.

E. Emergency

- Be familiar with the location and use of the following safety devices:

fire alarm	fire extinguisher	fire blanket
safety shower	eye wash stations	first aid kit
spill cleanup kit	fume hoods	protective respiratory gear
- In the event of an emergency, **dial 911**. By calling this number, variety of emergency response departments are alerted to the need.
- Be sure the names and phone numbers of lab personnel to be contacted in an emergency are posted on the outside of the door.
- If volatile, flammable, or toxic materials spill, shut off flames and spark-producing equipment at once. Do not cover windows or laboratory doors, except for special experimental requirements. This allows passers-by to notice if anyone is in need of emergency assistance.
- Affix biohazard or radioactive signs on the doors outside laboratories where biohazardous or radioactive materials are handled or stored. The protocol to be followed in case of a spill of the biohazardous material should be posted in a visible location.

VI. Selection and Use of Laboratory Equipment

Whenever lab equipment is purchased, preference should be given to equipment that:

- Limits contact between the operator and the infectious agent.
- Is corrosion-resistant, easy to decontaminate and impermeable to liquids.
- Have no sharp edges.

Every effort should be made to prevent equipment from becoming contaminated. To reduce the likelihood of equipment malfunction that could result in leakage, spill or unnecessary generation of aerosolized pathogens:

- Review the manufacturer's documentation, keep for future reference.
- Use and service equipment according to the manufacturer's instructions.
- Ensure that anyone who uses a specific instrument or piece of equipment is properly trained in setup, use and cleaning of the item.
- Decontaminate equipment before it is sent out for repairs or discarded.

VII. Training

Supervisors must verify that all employees thoroughly understand the safe operating procedures regarding laboratory safety. Basic or general lab safety training shall be done annually with specialized or job specific training, on safe operating procedures, scheduled annually or as deemed necessary by the attending supervisor.

Please reference the [NDSU Chemical Hygiene Plan](#) for additional information.