

Responsible Conduct of Research - Lab Safety Procedures

Purpose

The purpose of these procedures is to clarify and ensure Lab Safety at Mayville State University (MSU).

These procedures define the responsibilities of MSU affiliated individuals (e.g., faculty, principal investigators) who oversee and/or conduct classroom and/or research activities that are conducted in a lab environment that may pose significant risk to students, faculty and/or staff.

Procedures

MSU faculty, staff and students engaged in research activity (whether paid or unpaid) are required to be initially educated/trained and annually review the institution's Lab Safety policies and procedures. Faculty/Principal Investigator's/Project Director's must ensure and document students' engaged in research activity have been instructed in lab safety (as relevant to said research and/or courses).

Laboratory Safety Training will be provided by the Science Faculty and may be supplemented by training providers. Additional training may be required depending on the activities performed by the laboratory worker. Such training may include the use of specific equipment and/or other safety related topics specific to one's research.

The training sessions provided by MSU faculty give an overview of universal safety procedures for working with hazards that may be encountered in the lab. It is generalized and must cover safety items specific to each lab. As part of normal interactions with laboratory workers, lab supervisors must ensure they are trained in the safe and proper practices for the procedures and materials they use and any lab-specific safety measures they may take to protect themselves from exposure to hazardous materials, including the location and use of emergency equipment.

All new lab workers are required to receive lab-specific safety training from their Principal Investigator, or other designated experienced researcher. Emergency procedures and general lab safety procedures must be covered immediately when the new person joins the lab. Other items can be covered as the new researcher begins new procedures.

Documentation that the individuals have been instructed and/or evaluated on the topics or procedures is required and must be submitted to the Grants Office. Documentation consists of the Lab Safety Verification Training Record for each researcher and/or student researcher using the lab.

Reference(s)/Related Policies & Procedures

M18308	Responsible Conduct of Research
MP18308.2a	Student Research Procedures
MP18308.2b	Lab Safety Procedures

Adopted: April, 2016

Sponsors: President, Vice President for Academic Affairs, Vice President for Business Affairs, and Executive Director of Institutional Effectiveness

Mayville State University
Lab Safety Training Verification Form

Per University Procedure MP18308.2b, all individuals conducting research in Mayville State University science laboratories, paid or unpaid, including faculty, staff, students and visitors, must attend Laboratory Safety Training.

This form when completed documents an overview of universal safety procedures for working with hazards that may be encountered in the lab. It also covers safety items specific to each lab including safe and proper practices for the procedures and materials used and any lab-specific safety measures necessary to protect themselves and others from exposure to hazardous materials, including the location and use of emergency equipment.

Lab Specific Training Verification Form

Researcher Name: _____

Principal Investigator _____ Lab Location _____

Position/Title _____

Status: Faculty Staff Post-Doc Undergraduate Student

Supervisor Name: _____ Date: _____

The person providing instruction should initial and date each item when the topic is covered. Items that do not apply to the lab or the researcher should be marked "NA." After all of the relevant training has been completed, have the new lab worker sign and date this form and save it in your laboratory training records.

Initials & Date	Topic
<i>Emergencies</i>	
	Emergency procedures for medical, fire or safety emergencies (includes Blood Borne Pathogens, and other through a LMS and/or other institutional services) including reporting procedures.
	Basic building alarms, response to alarms
	Emergency Action Plan including: exits, evacuation routes and designated meeting locations
	Location of emergency equipment such as eyewash stations, fire extinguishers, fire pull stations, safety showers, etc;
	Reporting requirements for laboratory incidents and accidents, especially relating to personal injury
	Location and use of spill kit, first aid kit
	Location of emergency contact information, including Public Safety (911)
<i>General Lab Safety</i>	
	Proof of attendance to Laboratory Safety Training provided by MSU
	Process for raising and addressing health and safety concerns in the lab (who to report to)
	Food and beverages are not to be consumed in laboratories.
	No pets allowed in labs, unless designated as service animals (documentation necessary)

Initials & Date	Topic
	Protocols for transporting chemicals and other hazardous materials in hallways, e.g., use of secondary containers, no transporting in personal vehicles, use of state fleet vehicles, etc.
	Location and provision of personal protective equipment (PPE: gloves, glasses, lab coat)
	Protocol for PPE when outside of the laboratory, except when transporting hazardous materials (e.g., do not wear gloves in hallways, elevators, etc.)
	When to use PPE, including proper eye protection, for specific tasks
	PPE work practices (i.e. closed toed shoes, lab coats buttoned, disposable gloves, and wash hands after removal of gloves, removal of lab coats before leaving the lab, etc.)
	Lab security requirements (e.g., locked doors, access policies, non-supervised activities weekend and evening access and security protocol)
	Equipment cleaning and ongoing maintenance (including when to unplug)
	Proper storage, handling and disposal of broken glass, scalpels, razor blades, needles, syringes or other sharps.
	Hazards and proper use of compressed gases and cryogenic material, including moving cylinders, how to secure cylinders, procedures for attaching and removing regulators, etc.
<i>Chemical Safety</i>	
	Location and access to the Chemical Inventory, Chemical Hygiene Plan, and other safety information in the event of an accident/emergency.
	Material Safety Data Sheets (MSDS) access and use
	Methods and observations that may be used to detect the presence or release of a hazardous chemical in the lab (e.g. odor, monitoring equipment, or visual appearance) and what action to take if detected.
	Hazardous chemical labeling system used in the lab
	Specific use of laboratory hoods and other engineering controls
	Chemical storage and disposal procedures
	Location of chemical waste containers, use, labeling and compatibility (Hazardous waste management and disposal procedures)
	Chemical spill procedures, including spill kit location, cleanup and reporting
Applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No	<i>Biological Safety (BSL2 Materials and Recombinant DNA not Exempt from the NIH Guidelines)</i>
	Proof of attendance at Biological Safety Training
	Proof of attendance at Blood borne Pathogens Training
	Proof of attendance at Live Virus Worker Training
	Identification of all biological hazards in laboratory
	PI-approved use of sharps when working with infectious agents
	Review of protective equipment specific to the biological hazard(s)
	Personal Hygiene Procedures (hand hygiene, no eating and drinking in the lab)
	Review tasks that should be conducted in a biological safety cabinet
	Signs/ symptoms associated with infections that could be caused by exposure to agents handled in the lab and procedures for reporting suspected laboratory acquired infections
	Operation and use of lab equipment and decontamination methods
	Medical waste handling, including sharps disposal and disinfection of waste materials containing viruses, bacteria or other agents that could cause infection in humans
	Proper use of autoclave
	Biological material spill procedures, including cleanup and reporting

Initials & Date	Topic
Applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No	Radiation Safety- Not APPLICABLE
Applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No	Laser Safety- Class 3 Lasers
	Proof of attendance to Laser Safety Training provided
	General awareness of laser hazards, signs and symbols used in lab
	Type of hazards for specific lasers, e.g., eye, skin, ignition of flammable materials, etc.
	Laser Safety Officer name and phone number
Initials & Date	Other Topics
	High voltage safety

Equipment: List equipment found in your lab that requires orientation and proof of proficiency, such as chemical fume hoods, centrifuges, pressure vessels (including autoclaves), ovens, UV equipment, x-ray equipment, RF producing equipment, biosafety cabinets, cryostats, high voltage equipment, etc. Note whether use of this equipment requires supervision, PI approval and/or working alone is not permitted.

Equipment	Initials/Date Orientation	Initial/Date Proven Proficiency	Comments on working alone, supervision and/or PI approval
Fume Hoods			
Auto Claves			
Laminar Flow Hood			
UV Equipment			
Bench Top Centrifuge			

Operating Procedures and Higher Hazard Materials:

List the processes or specific chemical or materials that may present an elevated risk of serious injury or property damage. Review the precautions, safeguards and procedures associated with these materials or processes. Examples include, but are not limited to:

- Highly toxic metals, such as arsenic, lead, barium, etc.
- Hydrofluoric acid
- OSHA-defined particularly hazardous substances¹
- Nanomaterials
- Pyrophoric, explosive and water-reactive materials
- DEA controlled substances

Procedure/Material	Initials/Date Orientation	Initial/Date Proven Proficiency	Comments on working alone, supervision and/or PI approval
Chromic Acid			
Cadmium			

Your signature confirms that all items noted in this document have been communicated during a training session administered by the Principal Investigator or Laboratory Trainer and that you had the opportunity to ask questions.

Researcher Signature _____ Date _____

Training reviewed by: _____ Date: _____

Mayville State University Laboratory Safety Inspection/Walk Through

Date of Inspection:	Lab/Room:
Faculty Present:	Inspected by:

Area: Chemical Storage	Yes	No	Comments/Corrective actions to be taken
Chemicals segregated by hazard class <ul style="list-style-type: none"> • flammables are away from oxidizers • acids and flammables are separated • acids and bases are separated • nitric acid is separated from other acids 			
Chemical containers in good condition <ul style="list-style-type: none"> • unacceptable conditions include: rusty containers (including gas cylinders), leaking containers, and broken caps 			
Chemical containers properly labeled <ul style="list-style-type: none"> • primary original containers need to have a label on and the label must be readable • lab personnel need to tape labels on if they are falling off or make a new label that includes chemical name, hazards, and manufacturer (if this information is known) • secondary containers that are used for storage (e.g., squeeze bottles) need to be labeled with the chemical contents 			
Chemical containers closed <ul style="list-style-type: none"> • Containers should have lids or covers • Container lids or covers should be firmly secured unless actively pouring 			
Glass chemical containers are not stored on the floor			

<ul style="list-style-type: none"> • glass containers holding liquid chemicals (even water) or hazardous solid chemicals cannot be stored on the floor unless they are positioned in such a way (pushed way under a table) that they can't be broken 			
<p>Hazardous chemicals not stored above eye level</p> <ul style="list-style-type: none"> • hazardous chemicals must be stored at or below eye level 			
<p>Gas cylinders properly secured</p> <ul style="list-style-type: none"> • all cylinders must be secured snugly with a strap or chain that is above the middle of the cylinder (a single chain can be used to secure several cylinders as long as each cylinder is secured on at least three sides) — Exempt: lecture bottle 			
<p>Fume hood not used as permanent storage/ no clutter in fume hood</p> <ul style="list-style-type: none"> • fume hood should not be used as a permanent storage cabinet • fume hood should not be overly cluttered • fume hood sash should not be blocked by items or objects – sash should close all the way • all work should be performed at least 6 inches behind the sash of the fume hood • all equipment should be raised 1-2 inches off the surface of the fume hood • back baffle of fume hood should be clear of obstruction 			
<p>Fume hood sash closed when unattended/at or below 18 inches when attended</p> <ul style="list-style-type: none"> • the sash must be pulled down so that the vertical opening is no greater than 18" 			

Other:			
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Area: Ignition Sources	Yes	No	Comments
Vacuum pumps and other ignition sources are segregated from flammables/combustibles <ul style="list-style-type: none"> vacuum pumps and other significant sources of ignition, e.g., a Bunsen burner, cannot be stored near flammable chemicals or combustible material like paper or cardboard 			
Electrical cords are in good condition <ul style="list-style-type: none"> all electrical cords (that can reasonably be checked) should be in good condition, i.e., the insulation should not be worn, split, or frayed; the plug should not be separated from the cord; and the cord should not be pinched in a door or in any other way extension cords are not used as permanent wiring power strips are not connected in series (daisy-chained) 			
Other:			

Area: Sharps/Glass Waste	Yes	No	Comments
Glass waste disposal box properly used <ul style="list-style-type: none"> should not be more than ¾ full should not contain hazardous materials (look for unclean chemical bottles or untreated biological material) 			

<ul style="list-style-type: none"> • should not have liquids (look for signs of water damage to the cardboard or containers containing liquid) • should have structural integrity (check to see if the bottom is rotting) 			
<p>Sharps containers properly used/properly disposed when full</p> <ul style="list-style-type: none"> • sharps containers should not be more than $\frac{3}{4}$ full • sharps containers should not have bottles, beakers, etc. in them unless that glassware is INFECTIOUS • sharps cannot be discarded anywhere other than sharps containers 			
Other:			

Area: Good Practices	Yes	No	Comments
<p>Lab was secured</p> <ul style="list-style-type: none"> • if no one is present in the lab, the doors should be locked 			
<p>Excess clutter was not present in the lab</p> <ul style="list-style-type: none"> • look for signs of cluttered lab benches, fume hoods, and floors that goes beyond daily use (>24 hours) 			
<p>Items were not stored within 18 inches of a fire sprinkler head</p> <ul style="list-style-type: none"> • look for any items stored within 18 inches of a fire sprinkler head 			
<p>Food/drinks were not in the lab</p> <ul style="list-style-type: none"> • look for signs of food/drink in the lab (on desks, in trash cans, etc.) • storage of food/drink is not allowed 			

Other: Signs of unauthorized animals in the lab, etc.			
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Area: Emergency Equipment, Preparedness, PPE, and Egress	Yes	No	Comments
Exits and aisles clear of obstruction <ul style="list-style-type: none"> walkways should not be cluttered—need at least 3 feet of clearance in aisles up to two exits in each lab need to be free from obstructions and be usable 			
Emergency equipment clear of obstruction <ul style="list-style-type: none"> emergency equipment, e.g., showers, eyewashes, spill supplies, and fire extinguishers need to be unobstructed 			
Doors not propped open <ul style="list-style-type: none"> doors from main hallways or entrances to labs with hazardous materials should remain closed doors to rooms within a suite do not necessarily have to remain closed. It depends on the hazards present in each room in the suite 			
Appropriate spill supplies available <ul style="list-style-type: none"> one chemical spill kit is needed per lab group (if contiguous) if work with infectious agents is conducted, then biological spill supplies are needed 			
Electrical panels/disconnects clear of obstruction/ panel doors closed <ul style="list-style-type: none"> will usually be gray colored boxes 			
Eyewash tested within the past week/documentated in the past month			
Eyewash available			

<ul style="list-style-type: none"> • eyewash must be available within 10 seconds normal travel time and accessible (e.g., not behind a locked door) 			
<p>Lab personnel know how to get SDS</p> <ul style="list-style-type: none"> • lab personnel need to know how to get SDS; either paper copies in the lab, EHS office, or the internet • regardless of the system used, SDS must be available at all times 			
<p>Lab personnel have PPE available (including fire-resistant lab coats as needed)</p> <ul style="list-style-type: none"> • the clothing must be available and the lab staff must have the ability to obtain additional clothing as needed 			
<p>Lab personnel wear/use proper PPE while in lab (lab coat, gloves, glasses, etc.)/shorts/sandals are not worn in the lab</p> <ul style="list-style-type: none"> • if working with chemicals, at a minimum, lab staff need to wear eye protection, gloves, long sleeves, and long pants or a buttoned lab coat if shorts are worn • open toed shoes, e.g., sandals, are not allowed 			
<p>Emergency shower available</p> <ul style="list-style-type: none"> • emergency shower must be available within 10 seconds normal travel time and accessible (e.g., not behind a locked door) 			
<p>Emergency shower has been tested within the past year</p> <ul style="list-style-type: none"> • inspection tag must be marked showing that the shower has been tested within past year 			
<p>Fire extinguisher is available, mounted and clearly marked</p>			

<ul style="list-style-type: none"> • fire extinguishers must be mounted near the door and must also be marked with a prominent sign if the mounting is in a place where the extinguisher is obstructed from view • fire extinguishers must be readily available if there are hazards present that could potentially cause a fire 			
<p>Fire extinguishers are charged and have safety pins and seals.</p> <ul style="list-style-type: none"> • is the pressure gauge fully charged? The arrow should be in the green zone and oriented towards the “12:00” position if you were reading it like you would a watch or clock. • the safety pin should be firmly in place. • the safety seal (a piece of plastic ty wrap) should be connected to the safety seal and handle of the extinguisher. • carbon dioxide cylinders will not have a pressure gauge so we will only look for the safety pin and seal on these types of units. • check to see whether or not the fire extinguisher has been used or tampered with. The pressure gauge, safety pin, and seal will help us determine if usage or tampering has occurred. 			
Other			

Area: Other	Yes	No	Comments
No penetrations in walls, floor, or ceiling/ all ceiling tiles in place			

<ul style="list-style-type: none"> • look for punctured holes in the walls that were used to secure objects • manufactured floor drains do not count as a deficiency • check to see if any penetrations have not been sealed with fire retardant material 			
<p>Refrigerators/cooling equipment properly labeled</p> <ul style="list-style-type: none"> • non lab-safe refrigerators/freezers/coolers will need a black and white sticker with the wording “Do not store flammable solvents in this refrigerator” • the stickers (labels) are provided by EHS and are approximately 4” wide by 5.5” long 			
<p>Current lab signs/inventories posted at lab entrance</p> <ul style="list-style-type: none"> • a current EHS lab sign indicating chemical hazards in the lab and the laboratory emergency contacts must be posted near the entrance • if lab uses RAM, lasers, or biological materials then appropriate signs must be in place at the entrance • if lab does not use these hazards and misleading signs are present indicating otherwise then this would be a deficiency as well • verify whether or not other unusual hazards associated with the lab warrant signage such as electrical hazards, asbestos, electromagnetic area, strong radio frequencies, etc. 			
<p>Emergency instructions posted</p>			

<ul style="list-style-type: none"> • verify whether or not the lab has emergency instructions posted in the lab — ideally near phones or the entrance • EHS provides emergency instructions — verify whether or not they are present and the information at the bottom has been completed 			
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Area: To be Determined	Yes	No	Comments