

Minors in Laboratories and Shops

University of Tennessee Safety Plan LS-040

Document Contact: EHS-Lab Safety

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Purpose

UT System-wide [Policy SA0550 \(Minors in Laboratories and Shops\)](#) requires that affected campuses shall develop a written plan and appropriate supporting and administrative documents (e.g. forms) to address minors who are involved in university-sponsored activities in laboratories or shops on campus. This document represents the plan for the University of Tennessee, Knoxville departments or coordinated programs to protect the safety and health of minors on campus who are engaged in University sponsored activities in laboratories and shops.

The system-wide policy requires that this plan address:

- **Written policy** (see system policy and this document)
- **Hazard assessment** (see guidance below)
- **Training (and Information)** for the following
 - principal investigators
 - parents
 - students (i.e. minor-participants)
- **Waiver form** (Appendix A)
- **List of prohibited activities** (Appendix C)
- **Activities Requiring Exemptions** (Appendix B)

Important Note: The system policy is related to [hazards of research in labs](#). It is not directly connected to the system-wide policy regarding responsible conduct of **Programs for Minors (SA 0575)**

Scope and Applicability

This plan applies to minors who are not enrolled as a University student and are on campus attending Governor's School, STEM Academy, classes, and camps or are otherwise present in laboratories, shops, or other areas that contain hazardous substances or physical hazards.

Minors shall be permitted in labs and shops as defined in this plan only if they are engaged in university-sponsored activities.

The system-wide policy does not contemplate or authorize a minor who is not enrolled in the University as a student to be hired as a University employee. Approval of the appropriate department head is required to hire a non-University student under the age of eighteen (18) as a University employee.

Abbreviations and Definitions

Abbreviations

ACGIH: American Conference of Governmental Industrial Hygienists

CFR: Code of Federal Regulations

dBA: Decibels, A-weighted scale

EHS: Campus Environmental Health and Safety

IDLH: Immediate Dangerous to Life and Health

NFPA: National Fire Protection Association

NIOSH: National Institute for Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

PI: Principal Investigator

SCBA: Self-Contained Breathing Apparatus

SCUBA: Self-Contained Underwater Breathing Apparatus

TCA: Tennessee Code Annotated

Definitions

“Biological Hazard” (“Biohazard”) is defined as any agent (bacterium, virus, fungus, unicellular or multicellular parasite, or prion) or molecule/cellular product (protein, lipid, nucleic acid, etc.) capable of causing disease or other negative health effects. Biological hazards may be acquired through punctures/cuts, open or broken skin (cuts, scrapes, rashes, eczema, acne, etc.), mucous membranes, ingestion, or inhalation. Acquisition of disease and disease outcomes is influenced by route of exposure, dose, and individual differences, including age, health (particularly immune status), vaccination history, and genetics.

“Campus Safety Resources” includes the following groups:

- Biosafety Office
- Environmental Health and Safety, UTK
- Radiation Safety Office
- Risk Management Office
- UT Institute of Agriculture Safety Office

“Chemical Hazard”-is defined as any chemical which can cause a physical or health hazard. Examples of physical hazards include: explosive, flammable, oxidizing, corrosive, and gases under pressure. The health hazards can either be acute (short-term) and/or chronic (long-term). Factors that affect the hazard of the chemical depend upon the toxicity of the chemical, the route of exposure into the body, the dose, duration of exposure, reaction with other chemicals and individual differences (hereditary, smoking, etc..).

“Hazardous Substance” is defined as a chemical, biological, or radiological substance capable of causing injury or harm. “Hazardous Substance” includes definitions, classifications, and criteria established by 29 C.F.R. 1910.1200 Appendix A.

“Laboratory” is defined as a location where teaching, experimentation, or research occurs that involves hazardous substances or physical hazards. Examples include, but are not limited to, chemistry labs, biology labs, and chemical labs, engineering labs, or other similar places where the hazards described in this policy are present. For this policy, laboratories dealing with documents, computers, human subjects research, or other similar activities are not included. The UT System **Programs for Minors (SA 0575)** is a standalone policy that is still applicable for all areas on campus.

“Minor” is defined as any individual under 18 years of age and not enrolled in the University as a student.

“Physical hazard” includes, but is not limited to, the following:

- Exposed energized conductors operating at more than 50 volts AC
- Shear points, crush points, nip points, or run-in points that are not adequately guarded
- Pressure vessels operating in excess of 15 pounds per square inch for compressed gases
- Flammable liquids, solids or gases as defined by NFPA 30: Flammable and Combustible Liquids Code
- Cryogenic fluids and reactive materials as defined by defined by NFPA 45: Standard on Fire Protection for Laboratories Using Chemicals
- Noise above 90 decibels, A-weighted scale, averaged over an 8-hour day

“Principal investigator (PI)” is the administrative head of the research laboratory or shop. The principal investigator determines research/work objectives, designs experiments, and assigns responsibilities to laboratory/shop staff and students.

“Radiological hazard”:

The various types of radiation can be divided in to two categories:

- **Non-ionizing:** examples of non-ionizing radiation include visible light, ultra-violet and infrared radiation, microwaves, radio frequency radiation, and electromagnetic fields
- **Ionizing:** examples of ionizing sources could include: devices which produce X-ray radiation, devices which accelerate particles, sealed radioactive sources, or loose substances (solids or liquids) which emit ionizing radiation through man-made or natural processes.

“Shop” is defined as an area where wood, metal, masonry, plastic or similar products are manipulated by any means, such as cutting, drilling, boring, fastening (nails, rivets, screws, welds, etc.), sanding, grinding, heating, priming, finishing, or any similar activities.

“Supervisor” is defined as the PI or other senior individual assigned by the PI or Department Head (where a PI does not have primary responsibility for the space). The supervisor is competent in and can responsibly oversee the research/work procedures being performed to include proper technique(s) and safety precautions.

Roles and Responsibilities

The PI or Designated Supervisor shall:

- Complete the Safety Assurance form attached, Appendix A
- Ensure minors have received appropriate site-specific training
- Report accidents/injuries/exposures that occur to minors as soon as possible, following the UT Office of Risk Management reporting procedures <https://riskmanagement.tennessee.edu/>

- Conduct a hazard assessment for the minors' assignments
- Consult with campus safety resources as necessary
- Provide any necessary personal protective equipment
- Ensure minors do not undertake activities listed in Appendix C – Prohibited Activities
- Obtain exemption approval from Campus Safety Resources for certain hazardous activities –Appendix B.
- Maintain records as required under Recordkeeping section below

Campus Safety Resources shall:

- Provide guidance to departments, supervisors, and PI regarding this procedure and hazard assessments.
- Provide general lab/shop safety training
- Work with campus deans, directors, department heads, or program managers to ensure this procedure is disseminated
- Review and revise the procedure periodically
- Maintain records as required under Recordkeeping section below
- Keep the most current version of this procedure posted in the EHS safety manual and on safety office websites

Procedures

Hazard Assessment and Safety Assurance

The PI or supervisor shall conduct a hazard assessment of the tasks likely to be conducted by the by minor(s). Note that the Campus Safety Resources are available to assist with the hazard assessment. The hazard assessment shall be documented.

No minor shall be permitted to participate in prohibited activities as listed in Appendix C: Prohibited Activities.

The PI or supervisor will prepare a descriptive form that describes the minor's tasks, to be signed by the minor and the parent/guardian. A template for this form is attached as Appendix A. This descriptive form must include, at a minimum, the following:

- A detailed description of the minor's activities so that the minor and parent/guardian can make an informed decision about all risks associated with the proposed activity.
- Hazard specific safety training that must be completed by the PI or Supervisor with the minor.
- Assurance that the minor will be supervised at all times while in the facility and never left alone.
- Assurance that the laboratory/shop will be in full compliance with all applicable University safety programs and regulations.
- Identify the PI or supervisor responsible for the minor's activity so that minors/parents/guardians know who to contact with questions or concerns about the activity.
- The date(s) of the proposed activity for the minors/parents/guardians to consider.
- Clear, unambiguous language that is understandable to a layperson.
- A release completed by each minor/parent/guardian.
- Adequate time for each minor/parent/guardian to review the descriptive form and sign the release.

Exceptions

In view of the open and diverse research environment at UT Knoxville, this plan provides for limited exceptions to these requirements based upon review and written approval by EHS. In considering whether an exception to this plan is warranted, local departments should forward their request to EHS. Relevant information to consider includes: the specific laboratory environment; the minor's previous lab course work and/or related experience; the safety training the minor will receive; the ability of the lab to provide close supervision; and the purpose of the proposed lab experience (See Appendix C for more information on exemptions).

Personal Protective Equipment

All minors working in labs and shops must adhere to a laboratory dress code and use personal protective equipment (PPE) when working in potentially hazardous situations or around potentially hazardous materials and/or equipment. The PI or Supervisor will provide the necessary PPE and any instruction on how to properly wear the PPE.

Training

Minors

A general safety orientation (e.g. presentations, modules, documents) shall be made available and maintained by Campus Safety Resources. The general orientation can be conducted in-person by the principle investigator/supervisor or through electronic/online resources (e.g. Canvas). For more information on training, please contact EHS at safety@utk.edu or 974-5084.

Minors shall take all applicable modules (e.g. chemical safety, biological safety, etc.) of the general, self- study safety orientation before beginning work.

The minor's primary supervisor or PI shall address site-specific safety subjects. Subjects for this training shall be developed from the hazard assessment.

Principal Investigators or Designated Supervisors

Safety training is a specialized topic that not every Principal Investigator is prepared for. Principal Investigators should contact Campus Resources for methods to ensure best practices for minors. At a minimum Principal Investigators shall ensure they are familiar with this document and understand how to implement it. If they require assistance they should consult appropriate Campus Resources.

Parents

Parents can only make informed decisions regarding their children's participation if they are properly informed of the risks. Both the PI or Supervisor and/or Campus Resources will provide educational materials to assist parents and guardians.

Recordkeeping

The PI or supervisor is responsible for maintaining the lab- or shop-specific safety training documentation, safety assurance forms, and written hazard assessments as listed above.

General and specific training documents shall be maintained by the PI or Supervisor a minimum of (3) years. These records should be combined with the other documentation that the PIs must complete for the Programs for Minors programs.

Written Hazard Assessment

Written hazard assessments to cover any hazardous materials or associated procedures in the lab or shop are required (e.g. chemical hygiene plan; safety data sheets; Institutional Biosafety Committee-approved registration documents for recombinant DNA, infectious agents, or biological toxins; standard operating procedures which address risk and risk mitigation)

Safety Assurance Form and Rules for Minors in Shops and Labs Form (Appendix A)

These records shall be maintained for at least three years in accordance with safety procedure AD-015: Records Retention for Safety, Health and Environmental Protection, found in the safety manual. Records shall be kept longer in the event the minor is injured or if litigation is expected.

References

29 C.F.R. 1910.1200 Appendix A: (Hazard Communication: Health Hazard Criteria)

T.C.A. 50-5-106

SA 0550 Minors in Laboratories and Shops

SA 0575 Programs for Minors

NFPA 30: Flammable and Combustible Liquids Code

AD-015: UTK/EHS Records Retention for Safety, Health & Environmental Protection

Appendices

Appendix A: Safety Assurance

Appendix B: High Hazard Activities that Require Exemption

Appendix C: Prohibited Activities

Appendix A: Safety Assurance

Name of Minor: _____

Worksite Location: _____

Activity(ies): _____

Attach additional information if necessary

Responsible Principal Investigator or Supervisor:

I agree to sponsor the minor(s) identified above and by my signature below agree that:

1. I have read, understand, and will adhere to The University of Tennessee policy on “Minors in Laboratories and Shops.”
2. I will ensure the student has received the necessary training before participating.
3. I have reviewed or will review with the minor at the time of arrival on campus the hazards involved with participating in the lab or shop.
4. I have confirmed that necessary personal protective equipment appropriate for, and specific to, hazards will be provided.
5. This individual will be supervised at all times while in the laboratory or shop and never left alone. The laboratory or shop in which the minor will be working is in compliance with all applicable University of Tennessee safety programs and regulations.

Name of Principal Investigator or Supervisor: _____

PI/Supervisor Phone: _____ **PI/Supervisor Email:** _____

Signature: _____ **Date:** _____

{Over for remainder of form}

Minor

1. I have read, been told, and agree to follow the safety policies of The University of Tennessee.
2. I acknowledge and agree that there are risks involved with the activity(ies) as described above.
3. I have read, understood and signed the Rules for Minors in Laboratories and Shops.
4. I agree to complete safety/hazard or other required training provided by The University of Tennessee before participation in the activity(ies) described above.
5. I choose to voluntarily participate in this activity with full knowledge that the activity(ies) described above may be hazardous to me.
6. I agree that my participation may be suspended at any time, at the discretion of The University of Tennessee and its officers, agents, and employees, if I jeopardize my own safety or the safety of others.
7. I agree to release, indemnify, and hold harmless The University of Tennessee for any loss, liability, damage, or costs, including court costs and attorney's fees, that may occur as a result of my negligent or intentional act or omission while participating in the activity(ies) described above.
8. I agree to immediately report any accidents/injuries/exposures to the P.I. or Supervisor as soon as possible.

I have carefully read this document and had sufficient time to ask questions and be given answers. I sign this document voluntarily.

Name of Minor (print): _____

Signature: _____ Date: _____

Parent/Guardian

I, _____ (PRINT NAME), am the parent or legal guardian of the participant who has signed above.

1. I have read and understand what my child will be doing and the risks involved.
2. I understand that I may contact the PI or supervisor if I have questions or concerns.
3. I agree that my child's participation may be suspended at any time, at the discretion of The University of Tennessee and its officers, agents, and employees, if the safety of my child or others becomes a concern.
4. I certify my child has adequate health insurance necessary to provide for and pay any medical costs that may directly or indirectly result from my participation in the activity(ies) described above.
5. I have read and I understand this information and I consent to my child taking part in the activity(ies) described above, and I fully enter into and agree to the above Assumption of Risk and Release from Liability set forth above.

Name of Parent or Legal Guardian (print): _____

Signature: _____ Date: _____

Rules for Minors in Laboratories and Shops

1. Never participate on a scheduled assignment alone in any laboratory or shop environment without direct, immediate adult supervision from the P.I. or Supervisor.
2. Complete and follow safety training specific to the hazards in the laboratory or shop.
3. Always wear the personal protective equipment as directed and dispose of it appropriately. This personal protective equipment (PPE) includes goggles, gloves, coats/gowns, and other face/body protection as dictated by the hazard being worked with or around. Always remove PPE when leaving the work area.
4. Always follow the instructions of the P.I. or Supervisor.
5. Always report any accident (regardless of severity) immediately to the P.I. or Supervisor.
6. Always keep your hands away from your face and wash them well with soap and water prior to leaving any laboratory area and after removing gloves.
7. Never eat, drink, chew gum, apply lip balm, or touch contact lenses while in any laboratory environment.
8. Always wear closed-toe shoes while in any laboratory or shop.
9. Always tie back long hair to keep it out of all the hazards listed above.
10. Always wear clothing that reduces the amount of exposed skin.
11. Always ask questions if you don't understand the safety requirements.

Name of Minor (print): _____

Signature: _____ Date: _____

Name of Parent or Legal Guardian (print): _____

Signature: _____ Date: _____

Appendix B: High Hazard Activities that Require Exemption

The follow list of activities shall not be undertaken by minors, unless the Principal Investigator or Supervisor has received prior approval from EHS or other Campus Resources prior to activity. This list is not exhaustive.

- Hot work involving welding, brazing or torch cutting
- Operation of power-driven woodworking machines
- Operation of power-driven metal-forming, punching and shearing machines
- Non-ionizing Radiation-Exposure to lasers in hazard classes III or IV.
- Operation of circular saws, band saws and guillotine shears
- Presence near powder-actuated fasteners
- Construction Sites - Presence on construction sites
- Exposure to noise sources exceeding 90 dBA
- Chemicals that are flammable, corrosive, toxic, etc. that are used with appropriate controls and with specific Chemical Hygiene Plans and procedures in place
- Work with (or around) biological hazards which pose a moderate risk to human health and require enhanced safety and containment precautions (Biosafety Level 2)

High Hazard Activities Exemption Form

Principal Investigator or Supervisor Name: _____

Date(s) of Event: _____ Name of Event or Class: _____

Event Affiliation: _____

Worksite Location: _____

Approximate number of minors participating in event: _____

The following information needs to be submitted to the Environmental Health and Safety Office at safety@utk.edu and receive prior approval before allowing students to participate in activities listed in Appendix C.

1. Provide a class or event description of the event activities
2. Provide a copy of all procedures that will be followed when minors are conducting high hazard activities.
3. Provide a list of the personal protective equipment that the minors will be required to wear.
4. Explain the topics that will be covered in the required site-specific training. Attach a copy of any quizzes or other training tools that will be used.
5. Explain the plan for oversight ensuring that minors will be directly supervised at all times and there is adequate oversight for the number of minors participating in the activity.

Appendix C: Prohibited Activities

The follow list of activities shall not be undertaken by minors:

- Confined Spaces – Entry into a permit-required confined space
- Fall Hazards - Presence where an unguarded fall hazard exists. Note this does not apply to ladders
- Lockout/Tagout - Equipment maintenance, set-up, repair, adjustment or testing that would require lockout/tagout
- Excavation and Trenching - Presence in excavations
- Heavy Equipment - Operation of backhoes, front end loaders, forklifts, bulldozers, track hoes, bobcats, and similar heavy equipment
- UT Vehicles - Operation of UT vehicles, including all-terrain vehicles, motorcycles, carts, and any other motorized or electric conveyances
- Unguarded Power Transmission - Presence in close proximity to unguarded power transmission equipment such as fly wheels, rotating parts, drive belts/pulleys, screw conveyors, or any similar equipment
- Hazmat Spills - Clean up spills of hazardous materials
- Scaffolding - Presence on scaffolding more than 10 feet above the ground
- Handling open sources of radioactive materials, exposure to x-ray machines, or being left unattended with any type of ionizing radiation
- Non-ionizing Radiation –exposure to non- ionizing radiation sources exceeding standards established by the American Conference of Governmental Industrial Hygienists
- SCBA - Presence in situations where a self-contained breathing apparatus is necessary
- IDLH - Presence in situations that are considered immediately dangerous to life and health as defined by the National Institute for Occupational Safety and Health (NIOSH)
- Imminent Danger - Presence in situations that are considered an imminent danger (per safety policy number GS 102 (Imminent Danger); see the UT EHS Safety Manual at <https://ehs.utk.edu/>)
- Diving/Swimming – Where a self-contained underwater breathing apparatus (SCUBA) is used
- Activities in or about establishments manufacturing or storing explosives or articles containing explosive components
- Operation power-driven hoisting apparatuses
- Work with (or around) biological hazards which pose a high risk to human health and require high containment (Biosafety Level 3)
- Any other activities that the Commissioner of Labor and Workforce Development has declared by regulation to be hazardous or injurious to the life, health, safety and welfare of minors.
- Highly hazardous materials, including pyrophorics, explosives, large quantities of flammable materials (i.e., 4 liters or more), and compounds having a rat oral LD₅₀ less than or equal to 50 mg/Kg (e.g., hydrofluoric acid, acrylonitrile, osmium tetroxide, etc.); International Agency for Research on Cancer (IARC) Group 1 or 2A carcinogens or OSHA-regulated carcinogens; DEA controlled substances