THE UNIVERSITY OF TEXAS AT TYLER

Laboratory Safety Policy

September 2020

The University of Texas at Tyler Laboratory Safety Policy

INTRODUCTION

The University of Texas at Tyler (UT Tyler) is committed to the safety and well-being of all students, faculty and staff on its campus. UT Tyler offers a wide range of educational opportunities for students, including research work inside multifaceted academic and research laboratories. Laboratories allow students to receive real-world experience in their chosen area of study. The University of Texas at Tyler recognizes and encourages students to take advantage of this opportunity. This work can create potential safety concerns for our students, faculty, and staff. Therefore, certain guidelines and procedures should be in place to ensure UT Tyler gives students, faculty, and staff the opportunity to stay safe from potential laboratory hazards. All students, staff, and faculty are responsible for safety. This policy establishes required guidelines to keep UT Tyler laboratories running in an effectively safe manner.

PURPOSE

The University of Texas System policy, UTS 174, allows individual University's Department of Environmental Health and Safety (EH&S) to institute policies and programs which are in good keeping with safe work practices. This Laboratory Safety Policy institutes specific safety rules and programs for use within UT Tyler laboratory spaces as well as define their proper use. This policy also outlines mandatory training and documentation for compliance with these guidelines. Laboratory safety processes within this policy will allow UT Tyler and EH&S to consolidate safety procedures under one standard.

DEFINITIONS

Administrative controls – are protective measures implemented through laws, rules, codes, guidelines and all policies related to the safe operation within a laboratory. Examples include policies on working hours, experimental protocols, or how long someone can work in a laboratory.

BBP – Blood Borne Pathogen

Laboratory – Laboratories as defined in this policy refer to any room, space, or area from which the primary use includes handling potentially hazardous materials, including but not limited to handling chemicals, aerosols, biological organisms, or physical/mechanical hazards such as saws or heavy equipment. Art studios and many STEM laboratories, for example, are considered laboratories that fall under the guidance of this policy.

Engineering controls – are physical protective measures designed, engineered and implemented on or near a working space in order to reduce risk and/or mitigate hazards. Examples include guards on power equipment or ventilation over welding tables.

Hazard – Hazards refer to any chemical, biological agent or toxin, or physical/mechanical material (i.e. sharps, power tools, etc…) which may cause harm to persons or property; they are objects from which

potential danger can arise if not properly stored or handled. Principal Investigators and Laboratory Supervisors must make the determination whether a material is hazardous based all relevant documentation relating to the hazard to include SDS, manufacturers or providers documentation, and peer-reviewed literature as well as experience.

Hazardous waste – any waste accumulated in a laboratory that falls under the purview of regulated waste by Environmental Protection Agency (EPA), Resource Conservation and Recovery Act (RCRA), or Texas Commission on Environmental Quality (TCEQ).

HCA - Texas Health and Safety Code Title 6, Subtitle D, Chapter 502, Hazard Communication Act

IRB – Institutional Review Board

IACUC – Institutional Animal Care and Use Committee

IUPAC – International Union of Pure and Applied Chemistry

NFPA – National Fire Protection Agency

OSHA – Occupational Safety and Health Administration

PPE – Personal protective equipment

RCRA – Resource Conservation and Recovery Act

SDS – Safety Data Sheet

SCOPE

A. Policy administration

    1. The Director of EH&S or designee will provide administration and oversight of this policy.

B. Personnel affected by this policy

    1. This policy applies to all patrons engaged in activity within UT Tyler administered, owned or operated laboratories with potentially hazardous material or equipment, unless otherwise noted in this policy.

C. University departmental responsibilities

    1. Individual departments are responsible for faculty, student and staff compliance with this policy within their own departments.
    2. Departments will notify us of any new chemical and provide a Safety Date Sheet (SDS).
    3. Individual departments are responsible for informing EH&S of any new laboratory space, including both hazardous labs, nonhazardous academic labs, and research laboratories.

4. Responsibilities not befallen on departments by this policy fall on the principal investigators (PIs) and/or laboratory supervisors (LS) unless otherwise noted in this policy. Departments are responsible for ensuring PIs follow the stipulations in this policy.

D. Hazard Communication

1. UT Tyler complies with the Texas Health and Safety Code Title 6, Subtitle D, Chapter 502, Hazard Communication Act, (HCA).
2. Laboratories will include hazard signage on all doors leading into a laboratory. Signage will be compliant with the HCA and identify all possible hazards within the laboratory.
3. EH&S will provide the signage to the supervisors of the laboratory.

E. Risk Assessment

Prevention of accidents is key to a safe laboratory environment. This includes accounting for and assessing all risk associated within a laboratory space. Risk assessment and written procedures are imperative to a sound risk management process. UT Tyler laboratories that work with potentially hazardous material must include proper risk assessment strategies and procedures to mitigate risk. These strategies are documented on EH&S risk assessment forms. EH&S risk assessment forms are available here: https://www.uttyler.edu/safety/forms.php. The forms include: laboratory experiment/demonstration hazard assessment, laboratory risk assessment template and laboratory self-evaluation forms. These forms must be filled out and utilized for all procedures that can be potentially hazardous. These guidelines reflect requirements of National Fire Protection Agency (NFPA) 45 chapter 11 and chapter 12, referenced from NFPA 101 (2018) and NFPA 1 (2018), as well as guidance from 29 CFR 1910.1450.

1. Laboratory Experiment/Demonstration Hazard Assessment
    a. This form is mandatory for all experiments which include:
        i. Hazardous chemicals
        ii. Hazardous aerosols
        iii. Hazardous biological toxins/organisms
        iv. Formation of any of the above through experimentation or demonstration
    b. The principal investigator must review this form.
2. Laboratory Risk Assessment Template
    a. This form will allow for the identification and use of hazardous chemicals in a laboratory
    b. This form is mandatory for all hazardous chemicals in a laboratory.
    c. The principle investigator must review this form.
3. Laboratory Self-Evaluation Form

a. This form lists all annual EH&S inspection-related items and concerns inside a laboratory at UT Tyler.
b. This form is to help LS or PIs in preparation for annual laboratory inspections by EH&S or other inspecting authority.
c. The principle investigator or designee must review this form.

4. EH&S must receive a copy of these forms before execution of the protocol.

F. Protocols and Procedures

Detailed protocols and procedures are to be followed by laboratory personnel performing an experiment. They complement other administrative controls in the laboratory. They specify how work is performed, including which engineering controls to use, in order to reduce or eliminate hazardous incidents. Hazardous experiments, or experiments involving hazardous material, must be written and confirmed by the PI or LS. The PI or LS will decide which procedures are hazardous.

1. Procedures for experiments deemed hazardous shall detail the complete experiment.
    a. Describe techniques in the order in which the experimental procedures are performed.
    b. They shall include the location of each section of the experiment and ancillary tasks such as use of engineering controls, personal protective equipment (PPE), waste disposal (Section N) and location of chemicals, agents, or tools used in the experiment.
    c. Room maps can be utilized to describe protocol.
    d. Procedures must be examined by the lab supervisor or principal investigator for the lab.
    e. Changes to any procedure needs confirmation by the lab supervisor or principal investigators.
2. Once reviewed, the procedure must be followed at all times.
3. EH&S must receive a copy of hazardous protocols or procedures.
4. The procedure must be available in the lab in which the experiment is complete; preferably in electronic format, but a paper copy is acceptable.
5. Human research will comply with all Institutional Review Board (IRB) guidelines

G. Engineering Controls

Mitigation or elimination of hazards in laboratories may require the use of engineering controls. Engineering controls should be the first step in containing recognized hazards in the laboratory.

1. Ventilation systems
    a. New UT Tyler laboratory ventilation systems shall conform to the latest ANSI/AIHA Z9.5 and ASHRAE 110 standards.

i. EH&S will ensure ventilation such as fume hoods, Biosafety Cabinets, and snorkels are annually inspected and certified for use.

b. Renovations of greater than 20% to existing laboratory and/or their ventilation systems shall conform to the latest ANSI/AIHA Z9.5 and ASHRAE 110 standards.
c. Where risk of aerosol hazards accompany experimentation, the appropriate class of Biological Safety Cabinets (BSC) must be used.
d. Where risk of chemical fumes is present, appropriate fume hoods or ventilation snorkels shall be used.
e. Laboratory doors must remain shut at all times to keep fumes or aerosols from spreading.

2. Physical hazards shall be controlled with guards to protect individuals inside the laboratory from harm.

H. Chemical inventories

1. An inventory of purchased chemicals must be submitted to EH&S annually (by December 31st) by all departments that handle chemicals. Contact EH&S for a complete list of departments with chemicals.
2. Each laboratory must maintain its own chemical inventory and be able to submit it to EH&S upon request.
3. Chemical inventories must contain, at a minimum, the following information for all chemicals or mixtures maintained by the laboratory and/or department:
    a. The name of the chemical or mixture (as listed on the SDS).
    b. The CAS number (or numbers if mixture).
    c. The hazard codes (or "H" codes) or statement of the physical and/or health hazards as listed on the SDS.
    d. The total maximum quantity kept on site.
    e. The type and condition of storage (flammables cabinet, vent hood, corrosives cabinet, etc…).
    f. Storage location including building and room number.
4. All new chemicals on the inventory must be accompanied by an SDS that shall be submitted to EH&S for inclusion in the UT Tyler online SDS system.

I. Occupation within laboratories

Access control is a cornerstone of safety and security within laboratories. Risk of hazards and accidents increases when untrained personnel or those with malicious intent gain access to laboratories. As such, only authorized personnel may be allowed to enter UT Tyler laboratories. EH&S will make every effort to enforce the following access controls on select patrons.

1. Minors

a. Minors are not to occupy any UT Tyler laboratory spaces, unless given specific permission, such as dual credit courses and guided tours for potential students. Contact UT Tyler Human Resources for more information.

2. Teaching laboratories
    a. Faculty, staff, invited guests, and students registered for the specified class, room number, dates, and times may occupy the laboratory.
    b. The students must be trained accordingly (see section K).
3. Research laboratories
    a. PIs and LSs must have only trained and qualified students, faculty and staff in their laboratory.
        i. EH&S offers general training for different labs including biology, chemistry and engineering. Contact UT Tyler EH&S for more information.

J. Laboratory Dress Code

Laboratories that contain hazards require thought and preparation prior to use by laboratory personnel. Wearing the proper clothing before entering a laboratory is therefore a requirement. It is the responsibility of the PI or LS to ensure lab specific personnel protective equipment (PPE) and clothing are worn. General clothing that must be worn in all laboratories considered hazard are as follows:

1. Close-toed shoes are required in all UT Tyler laboratories.
    a. Boots and sneakers are examples of close-toed shoes
    b. Sandals, flip-flops, jellies, high-heeled shoes are examples of shoes not allowed in UT Tyler laboratories
2. Jewelry must not interfere with experimental operations or Personal Protective Equipment (discussed in section H).
    a. Oversized jewelry, large watches, large hoop earrings are examples of jewelry that may interfere with safe procedures or protective clothing.
3. Shorts at least down to the knee or pants should be worn in a laboratory unless hazards from spills are present, then only pants should be worn.
4. Tops with sleeves must be worn in laboratory.
    a. Long sleeve shirts, T-shirts, sweaters, and lab coats are examples of appropriate tops.
    b. A-tops, midriffs, and sleeveless shirts are examples of inappropriate laboratory attire.
5. Personal Protective Equipment

    PPE is the last resource to protect laboratory personnel, after administrative and engineering controls are in place. PPE protects laboratory personnel from physical, biological and chemical hazards of their environment. Personal protective equipment (PPE) shall be worn in a manner which protects laboratory personnel at or above those outlined in 29 CFR 1910.132, .133, .134 and .138.

a. Eye protection is required in all UT Tyler laboratories where potentially hazardous work is being performed.
b. Gloves and lab coats shall be worn if laboratory personnel are working directly with hazards.
c. Individual PIs or LSs will consult with EH&S if needed to incorporate appropriate PPE into their experimental protocols.

K. UT Tyler EH&S laboratory programs

UT Tyler has many opportunities for students to learn within a laboratory setting. Disciplines of Engineering, Chemistry, Biology, Industrial Technology and Nursing are all distinct laboratory experiences with different potential hazards. Therefore, EH&S has separate general safety programs for the separate disciplines. These programs are peer-reviewed and give specifics per discipline. Programs are updated as necessary by EH&S and the departmental peer-review process to account for new science and technology as they relate to safety in the laboratory. They are therefore an addendum to this policy and can be found on the UT Tyler EH&S website or by contacting the department directly. Contact EH&S for more information.

1. Individual departments shall stay in compliance with their particular department's program (e.g. Biology, Chemistry, Nursing, Health and Kinesiology, Pharmacy and Art) or specialty program as it relates to the individual lab (e.g. Radiation Safety Program, Laser Safety Program).
2. EH&S will maintain and update these programs annually through a standard peer-review process.
3. Send questions, comments and/or suggestions about all EH&S policies and programs to safety@uttyler.edu or call at (903) 566-7011.
4. The most current version of this policy and all programs can be found at the UT Tyler EH&S website here: https://www.uttyler.edu/safety/laboratory-safety.php.

L. Training

UT Tyler has established training based on departmental specific programs (section K) that will aid in the safe engagement of laboratory work.

1. Faculty, staff, and part-time employees from within their respective disciplines will receive EH&S assigned safety training every three (3) years within their discipline.
2. Students enrolled in academic laboratory courses identified as potentially hazardous, as well as instructor-approved volunteer students and graduate students within research laboratories, shall be assigned safety training annually based on programs from their discipline and other training required by EH&S.

M. Container Labels

Labeling requirements are required and enforced on a Federal and State level. The following

rules must be followed for original or secondary containers.

1. Original containers must include information as outlined in 29 CFR 1910.1200(f).
    a. Replacement container labels shall also contain the same information.
2. Semi-permanent secondary containers must be clearly marked with:
    a. Name of substance (common name or abbreviation).
        i. Chemical formulas will not be used in place of chemical/molecule names.
        ii. No International Union of Pure and Applied Chemistry (IUPAC) names of chemicals should be used if a common name exists.
        iii. If the substance is unknown at the time of containment, then a clearly written, "unknown," should be placed on the container.
    b. Creation date.
    c. Identifying mark of creator (initials or signature).
    d. Section M does not include containers in active use during experimentation or demonstration. However, if the container with product will be in active use for more than one (1) week then Section M does apply.
3. Waste bottle labeling is covered in section P.

N. Storage

1. Storage of chemical hazards shall comply with NFPA 30, NFPA 45 *and* storage guidelines from the SDS (Section 2 in the new Global Harmonized System).
2. Storage of microbiological agents including cells, steroids, toxins, etc., will be in compliance with manufacturer specifications.
    a. If those references are no longer available every effort will be made to contact the supplier to get the references.
    b. If the supplier is no longer available then contact UT Tyler EH&S for the proper storage requirements.
3. Storage of living organisms such as fish, snakes, or ants shall comply with all Institutional Animal Care and Use Committee (IACUC) guidelines.
4. Hazardous Waste storage is covered in Section P.

O. Laboratory Inspections

Laboratories may come under periodic inspection by Federal, State or local authorities. This policy, its accompanying programs and EH&S inspections help UT Tyler maintain adherence to inspecting authorities.

1. EH&S shall perform safety inspections and fume hood inspections annually.
2. The inspections will encompass all material covered in Appendix F of the Laboratory Safety Manual (Chemical Hygiene Plan).

3. EH&S will ask PIs or LSs for a range of times acceptable for lab inspection
    a. Every effort will be made by PIs or LSs to be available

P. Hazardous waste

The Resource Conservation and Recovery Act (RCRA) of 1976 and the U.S. Department of transportation regulates the collection, transportation, and disposal of hazardous waste. UT Tyler will comply with all sections of these laws. EH&S has set policies and guidelines for disposal of laboratory waste in the Hazardous Waste Program and Lab Waste Manual. The Lab Waste Manual can be found on the UT Tyler Hazardous Waste Management website here: https://www.uttyler.edu/safety/files/hazardous-waste-program.pdf.

Q. Accident reporting and investigations

Small or inconsequential accidents inside laboratories could lead to larger problems. Therefore, all laboratory accidents no matter how minor must be reported. Accident reports are submitted through UT Tyler EH&S. The protocols and forms for accident reporting can be found here: https://www.uttyler.edu/safety/workers-comp/. Equipment, physical infrastructure, or other conditions that make an area unsafe should be reported on an Incident Report form to EH&S at safety@uttyler.edu. The report can be found here: https://www.uttyler.edu/safety/files/incident-report-form.pdf. You can also simply call EH&S at (903) 566-7011 to report unsafe conditions.

R. Laboratory decommissioning

Laboratory decommissioning is the process ensuring all laboratories are free of hazardous substances once a laboratory space becomes unoccupied. This includes testing for and removal of legacy chemicals, toxins, microorganisms and/or contaminated equipment or materials.

1. Decommissioning of laboratories will follow the Laboratory Decommissioning Program found on the UT Tyler EH&S website here: https://www.uttyler.edu/safety/files/laboratory-decommissioning-program.pdf.

S. Enforcement

1. Personnel are not allowed to be in laboratories who do not follow the procedures set in this policy.
2. Laboratory professors, LS, PIs, department heads, deans, or EH&S shall deny access to laboratory personnel that do not follow the rules set in this policy.

PERIODIC REVIEW AND CONTACT

This policy will be periodically reviewed for updates or conflicts. All inquiries, comments, questions, concerns or improvements should be directed to UT Tyler's Department of Environmental, Health and Safety: safety@uttyler.edu or (903) 566-7011.

September 18, 2020: Addition of links to websites mentioned in January 2020 version; update unclear wording.