CTPS 6108  
General Laboratory Safety & Good Laboratory Practices

LSO Basic Biological
The goal of this course is to provide participants with an understanding of basic biological lab safety. The content informs the lab user of UTMB policy, lab processes, and lab procedures (including emergency procedures), some of which is driven by legal requirements. The intent of this information is to have the student integrate these best practices, procedures and information into their laboratory work practices.

Objectives: in this course you will learn:
- The location of UTMB policy governing biological safety and who the governing bodies are for biological safety at UTMB;
- Specific agents needing controlled usage;
- Special rules for certain materials;
- Definitions of:
  - Biological agents and who approves them;
  - Risk Groups;
  - Biosafety levels (1, 2, 3, and 4);
  - Universal precautions;
- Exposure Control – defined pathways;
- Exposure reporting requirements;
- Biological Safety Cabinets requirements, uses, limitations, rules for use, required procedures, and functionality;
- Best practices for working in a Biological Safety Cabinet;
- Proper biological inactiviation process, disinfectants, and decontamination procedures;
- Fire potential in Biological Safety Cabinets;
- Spill protocol in the lab for biological agents
- Shipping protocol for biological agents (requirements, packaging and training Federal requirements)

LSO Chemical Safety
The goal of this course is to provide you with the knowledge necessary to understand chemical safety in the laboratory. The content informs the lab user of UTMB policy, chemical labeling requirements, importance of waste minimization, value of inventory tracking, and storage procedures for hazardous chemicals. Much of this is driven by legal requirements. The intent of this information is to have the student integrate these best practices, procedures and information into their laboratory work practices.

Objectives: in this course you will learn to:
- Return chemicals to storage areas when not in use.
- Always have chemical spill supplies available.
- Store acids and bases separately, & NEVER store oxidizers with organics.
- Refrigerate solvents only in an explosion proof refrigerator or freezer.
- Use highly volatile & flammable liquids only in a chemical fume hood.
- In case of a mercury spill, contact Environmental Health and Safety.
Compressed gases present a potential toxin hazard and a potential projectile hazard.

Segregate incompatible chemicals that may react even while in storage.

Dispose of chemicals which may become hazardous with age.

Dispose of all chemicals according to policy.

LSO General Lab Safety

The goal of this course is to provide you with the knowledge necessary to understand general laboratory safety. The content informs the lab user of UTMB policy, regulatory agencies governing lab safety, the role of Environmental Health and Safety at UTMB, the role of the Principal Investigator, the role of UTMB Safety Committees, how to identify potential hazards in your work environment, the types of hazards such as chemical, physical, and biological, the necessary steps to prevent hazards, and the steps necessary to control personal exposure. Much of this is driven by legal requirements. The intent of this information is to have the student integrate these best practices, procedures and information into their laboratory work practices.

Objectives: in this course you will learn:

- The multiple agencies that govern laboratory safety at UTMB including the EPA, NIH, CDC, CAP, TDSHS, USDA, TCEQ, DHHS, and the City of Galveston.
- Institutional policies for safety are established by the following committees: Chemical Safety, Radiation Safety, Biological Safety, and Institutional Safety.
- The “Hierarchy of Controls” includes elimination/substitution with less hazardous materials, engineering controls, administrative controls and personal protective equipment (PPE).
- Types of hazards are chemical, biological, and radiation.
- Considerations for evaluating risk include:
  - Dose response,
  - Duration and frequency, and
  - Route of exposure.
- Exposure routes include dermal, ingestion, inhalation, and injections.
- Personal Protective equipment (PPE) such as eye protection (e.g., safety glasses with side shields, chemical splash goggles and face shields) and chemical resistant gloves are worn as barrier protection from hazards in the lab.
- Biosafety cabinets and chemical fume hoods are containment devices designed to minimize exposure potential if used properly.
- The proper use of directional air flow can contain contaminants. Two examples of this are negative air flow for normal lab environments and positive airflow for surgical environments.
- Lab employees should know basic first aid procedures and what procedures to follow in the event of a workplace injury.
An easy method for remembering the **Fire Safety Guidelines** is the word RACE, which stands for **Rescue Alarm Confine and Evacuate or Extinguish**.

- The use of electrical equipment in the lab involves common sense. Electrical equipment should be inspected before use and maintained in good condition.
- All lab equipment including refrigerators, pressure vessels, vacuum apparatus and ventilation devices demand a degree of respect and care.
- Eyewashes should be flushed by lab staff at least weekly.
- Corridors are not to be used for storage.

**LSO Hazardous Waste Disposal**

The goal of this course is to provide you with the knowledge necessary to understand hazardous waste disposal at UTMB. The content informs the lab user of UTMB policy, proper segregation of normal trash, sharps, biohazards, chemical and radioactive wastes, UTMB’s liabilities with respect to improper hazardous waste disposal, the characteristics that define a “hazardous waste”, the importance of source minimization, Satellite Accumulation Area requirements, and medical or “red bag” waste identification. Much of this is driven by legal requirements. The intent of this information is to have the student integrate these best practices, procedures and information into their laboratory work practices.

Objectives: in this course you will learn:

- Hazardous waste is determined through process knowledge and analytical data. Segregate chemical, biological and radiological according to the waste classification.
- Many solid chemicals that do not display hazardous properties and are low in toxicity are considered non-hazardous. However, if your lab decides to discard stock chemicals in the original containers, they are managed through the EHS – EPM Chemical Waste Disposal Program.
- It is illegal to discard chemicals in regular trash, down the drain, or evaporate in the chemical fume hood.
- Laboratories generating hazardous wastes are considered satellite accumulation areas. It is the laboratory staff’s responsibility to collect all hazardous chemical wastes and properly dispose of them through EHS.
- Failure to comply with appropriate disposal procedures will result in citation and substantial fines for the University.
- Sanitary sewer disposal of any chemical waste must have prior approval from EHS in writing. Without written approval the action of drain disposal for chemical wastes is considered illegal.
- Satellite accumulation area requirements include:
  - All hazardous waste containers must be kept closed except when their contents are in direct use;
  - Every container must be clearly marked with the material’s identity and the words “Hazardous Waste”.
**LSO Recombinant DNA**

The goal of this course is to provide you with the knowledge necessary to understand recombinant DNA (r-DNA) safety requirements at UTMB and those required by the National Institute of Health. The NIH Guideline requires specific safety training as part of grant funding, with which this class fulfills. Class content informs the lab user of the framework in which r-DNA is closely examined by UTMB (utilizing NIH guidelines), responsibilities of users and support personnel in regard to r-DNA, outlines categories of work and the required associated risk assessment. Most importantly is covers actions necessary when spills occur and direction on exposure/incident reporting.

**Objectives:** in this course you will learn:

- Definition of recombinant DNA
- Review of and defines the function of the NIH OBA and its mission, as well as the function of NIH RAC.
- Outlines the roles and responsibilities of UTMB’s EHS Department, each Principal Investigator and all laboratory personnel.
- Reviews and defines each category of the 6 NIH classifications for r-DNA work and who approves each category prior to commencement of work.
- Defines the required risk assessment used to determine the appropriate NIH category.
- Defines when UTMB’s Institutional Biosafety Committee (IBS) must be notified and/or approve r-DNA work.
- Provides pointers on information needed on a NOU.
- Reviews Fink Committee and Dual Use
- Reviews spill procedures and protocols
- Defines exposures and details reporting requirements for exposures and incidents.

**Basic Good Laboratory Practices**

This segment is designed as an introductory course to the U.S. Food and Drug Administration’s (FDA) Good Laboratory Practice (GLP) regulations. Upon completion, participants will possess a basic knowledge of the U.S. FDA GLP regulations and the applicability of the regulations to research studies performed at UTMB. Course materials include a copy of the regulations, an FDA Warning Letter, and a copy of the UTMB
Institutional policy on performing GLP studies. In addition to registering via MyStar, participants also are asked to make reservations via [https://my.utmb.edu/PStraining](https://my.utmb.edu/PStraining).

Objectives: in this course, you will learn:
- about each section of the regulations,
- scope of the regulations,
- key personnel roles and responsibilities,
- requirements for developing standard operating procedures, and
- overview of the history behind the birth of the GLP regulations, including:
  - examples of poor animal housing conditions,
  - sloppy documentation, and
  - fraud

**Grading:**
Will be based on:
- Successfully completing and passing each section of the course
- Attendance at and participation in both of the didactic sections on Good Laboratory Practices

**Evaluation:**
As part of the overall course grade, students also are required to complete an evaluation form at the end of each term. If the evaluation form is not received, an “I” or incomplete grade will be reported to the Office of Enrollment Services.
The Evaluation is designed to monitor the effectiveness of the lectures and other course activities. The results will be used to make any needed modifications for the following year of the course. This information also will be relayed to a separate committee that oversees the course. ALL STUDENTS are required to complete the evaluation forms. **Anonymity will be preserved with this online survey.**

**Textbooks:**
None required