

EXPERIMENTAL RISK ASSESSMENT GUIDANCE TOOL

An experimental risk assessment is a systematic process used to identify, evaluate, and manage potential hazards associated with experimental procedures conducted during instructional laboratory courses. It is an essential component of a laboratory's safety program, helping to protect faculty, staff, Teaching Assistants (TAs), students and the environment from harm. A well-conducted risk assessment ensures that experimental work is performed safely, efficiently, and in compliance with relevant regulations. A new risk assessment should be completed and documented each time a new potentially hazardous experiment is carried out or when there is a change in the experiment. After control measures are implemented, standard operating procedures and training should follow to ensure TAs and students are aware of the correct steps to take and can reference such material as needed.

Use this guidance tool when completing the [Experimental Risk Assessment Form](#).

Below are the key elements of a laboratory risk assessment:

1. Identify Hazards

All research and instructional labs are required to complete a [Laboratory Hazard Assessment](#), which helps identify the following potential hazards. To get started, contact EH&S at ehslaboratory@ucr.edu.

- **Chemical Hazards:** Identify hazardous chemicals used in the lab, including flammables, corrosives, toxics, carcinogens, and reactive substances. Safety Data Sheets (SDS) provide valuable information about chemical hazards.
- **Biological Hazards:** Identify any biological agents such as bacteria, viruses, fungi, or other microorganisms that could pose a health risk, especially those classified as biohazardous.
- **Physical Hazards:** Identify risks associated with physical factors, such as noise, vibration, radiation (ionizing and non-ionizing), temperature extremes, and mechanical equipment (e.g., centrifuges, autoclaves).
- **Ergonomic Hazards:** Identify ergonomic risks related to repetitive tasks, awkward postures, or manual handling of heavy equipment or materials.
- **Electrical Hazards:** Identify risks associated with electrical equipment, such as shocks, burns, or equipment malfunctions.

2. Perform Risk Assessment

Complete the [Experimental Risk Assessment form](#). For assistance, contact EH&S at ehslaboratory@ucr.edu.

- **Task/Activity/Chemical** – input the hazardous process, chemical/substance or hazardous equipment that will be or is being used for the experiment. You can use the information in *Step 1: Identify Hazards* to help complete this box.

- **Significant Hazard** – input the hazard that relates to the hazardous process, chemical/substance, or equipment. A Safety Data Sheet (SDS) is a useful piece of information for this section if your process includes hazardous materials (e.g. chemical or substance).
- **Potential Consequence of Hazard** – note the potential consequence of the hazard such as loss of research, property, injury, or death. A SDS may also be useful here.
- **Initial Risk Level** – use the *Risk Assessment Matrix* tool below to determine if the risk is low, medium, or high.

When evaluating risks, assess the **probability** that a particular hazard could lead to an incident. Consider factors such as frequency of exposure, duration of exposure, and the inherent nature of the hazard.

Evaluate the potential **severity** of the harm that could occur if the hazard is realized. This can range from minor injuries to severe health effects or fatalities.

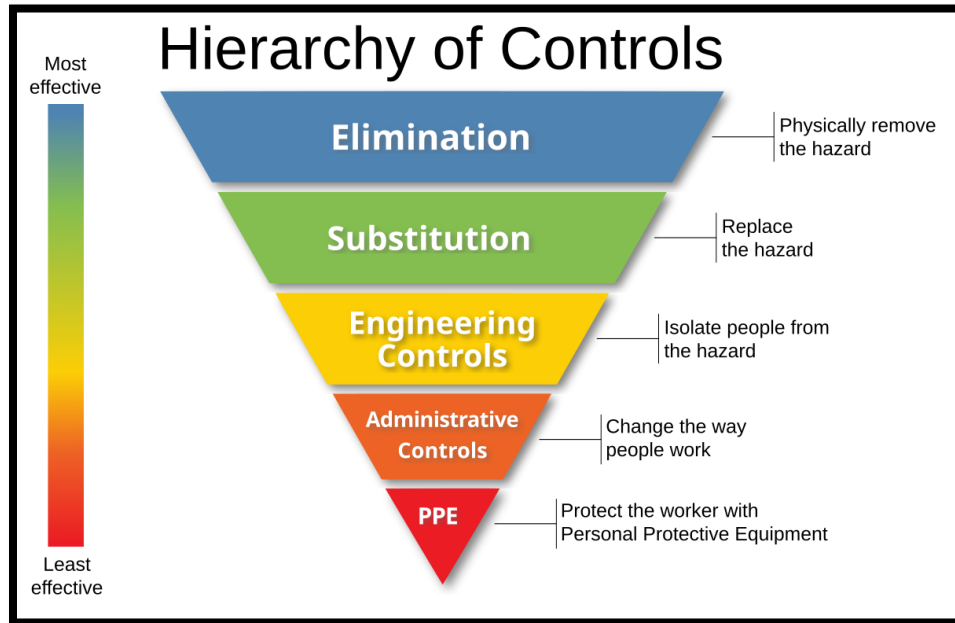
Determine the potential routes of exposure (e.g., inhalation, skin contact, ingestion) and who might be exposed.

RISK ASSESSMENT MATRIX		CONSIDER THE LIKELIHOOD OF A HAZARDOUS EVENT OCCURRING				
		Very unlikely to happen	Unlikely to happen	Possibly could happen	Likely to happen	Very likely to happen
CONSIDER THE SEVERITY OF INJURY/ILLNESS	Catastrophic (e.g. fatal)	Moderate	Moderate	High	Critical	Critical
	Major (e.g. Permanent Disability)	Low	Moderate	Moderate	High	Critical
	Moderate (e.g. Hospitalisation/Short or Long Term Disability)	Low	Moderate	Moderate	Moderate	High
	Minor (e.g. First Aid)	Very Low	Low	Moderate	Moderate	Moderate
	Superficial (e.g. No Treatment Required)	Very Low	Very Low	Low	Low	Moderate

- **Control Measures** – input what control measures are in place or need to be in place in order to reduce the risk. If you are unsure of control measures for your task, consult with EH&S. Refer to *Hierarchy of Controls* below for assistance with determining what type of control measure are most effective to implement. An

example of a control measure is utilizing a fume hood when working with chemicals, or substituting a hazardous chemical with a less hazardous chemical.

NIOSH developed a *hierarchy of controls* as a means of determining how to implement feasible and effective control solutions to exposures and hazards. Control methods at the top are potentially more effective and protective than those at the bottom. Following this hierarchy normally leads to the implementation of inherently safer systems, where the risk of illness or injury has been substantially reduced.



Elimination or Substitution: Where possible, eliminate the hazard or substitute it with a less hazardous alternative (e.g., using a less toxic chemical or conducting a less hazardous procedure).

Engineering Controls: Implement physical changes to the workplace, such as installing fume hoods, biosafety cabinets, or ventilation systems to reduce exposure to hazards.

Administrative Controls: Develop and enforce safety policies, standard operating procedures (SOPs), training programs, and work schedules to minimize risks.

Personal Protective Equipment (PPE): Ensure appropriate PPE is available and used correctly, such as gloves, lab coats, safety goggles, and respirators.

- **Final Risk Level** – After control measures are in place, indicate the final risk level. The final risk level should be less than the initial risk level.