

# Two-Day Lab Safety Short Course

## **Safety Training Investment Can:**

Protect your students  
Reduce you Workman's Comp cost  
Show you care  
Create a safer environment  
Improve morale  
Set the correct pattern for life

## **Here's an overview of the sections of the course...**

### **Introduction**

Safety is really just a matter of choices. But, you are not free to choose unless you know the choices. And, equally importantly, you don't make the best choices unless you understand the consequences. This course teaches about the choices and the consequences in a way that makes them both fun and memorable.

### **Scope of the Problem**

Life is filled with hazards. Labs have them too, but that's just part of life. Tens of thousands of people die and millions are injured each year. Billions of dollars are wasted. And yet, the solution is clear, simple, and obvious. By taking the time to make health and safety an integral and important part of science education, work, and life, we can live safer, healthier, longer lives.

### **Accidents**

LSI has been collecting anecdotal accounts of lab accidents for 35 years. In this section we share some stories. They are powerful examples, make lasting impressions, and serve as a graphic reminder. The stories have been published in our series, Learning By Accidents Volume 1 & 2. Please send us your account of the most serious lab accident you recall.

### **Legal Aspects**

One of the unfortunate outcomes of accidents is a lawsuit. Liability and negligence issues can't be ignored in today's lab operations. In this section we explain the types of negligence, the responsibilities of supervisors and employees, and how to reduce the likelihood of lawsuits.

### **OSHA Lab Standard**

OSHA requires most labs to have a chemical hygiene officer (CHO) and a written chemical hygiene plan (CHP). The twelve sections of the standard are explained with examples drawn from successful programs. You'll have a much better idea of how to be an effective CHO and what belongs in a good CHP.

### **Fire Control**

Can you explain the difference between flash point and auto-ignition temperature, between detonation and deflagration, between fire triangle and fire tetrahedron? How many gallons of flammable liquid should you have in your lab? Which fire extinguisher is right for which kind of fire and what's the easy way to remember? Where are the hidden sources of ignition?

## **Labeling**

What is the essential information that belongs on a label? I cover some labeling systems and describe the kinds of problems that result from poor labeling practices.

## **Biological and Animal Hazards**

Infection is the biggest problem. Five percent of lab infections result in death.

Appropriate precautions are discussed along with other bio lab hazards including fieldwork.

## **Handling Glassware**

There are three types of glass. Each has it's own special lab uses. Cleaning methods, insertion techniques, hot glass, storage, pressure and vacuum are discussed.

## **Eye and Face Protection**

The ANSI standard sets the stage for a discussion of glasses, goggles, and face shields. When should each be used? Why are ANSI approved safety glasses four ways better than street glasses? Contact lens use, portable shields, and eyewash fountains with the related problem of a blindness causing amoebae are covered in this section. Who was Bob Aspromonte?

## **Planning for Emergencies**

What are the twelve most common types of lab emergencies? What immediate action should be taken? How should you prepare to deal with those emergencies? Sadly, less than five percent of the more than 35,000 scientists and science educators I've spoken to have been discussing these emergency situations with their colleagues or written plan to deal with them.

## **Handling Chemicals**

There are four properties of chemicals, which make them dangerous. I review those properties and draw the connection to similar chemicals in our homes. What about the experimentation? What are the prudent practices, protective equipment and protective facilities needed to minimize the risk?

## **Ventilation**

I discuss the types of ventilation in a building and the public health recommendations for fresh air. Then, I shift to laboratories and fume hoods, their use and misuse. There are several types of chemical fume hoods. The various types and their operation are reviewed.

## **Electrical Safety**

Here is an area of lab safety that most lab workers don't understand. Ninety-nine percent of the people I speak to were never taught the correct way to plug in a two prong unpolarized plug. You'll learn that here along with a graphic and musical demonstration of why ground fault interrupters are necessary.

## **Your Most Serious Problem**

Now you are going to sit in on the discussion by the seminar participants of their most serious lab safety problem. I'm sure many of them might well be yours as well.

## **Storage of Chemicals**

Six critical areas are discussed: Access, Space, Fire Control, Ventilation, Shelf Security and Arrangement. I think keeping the door locked is the most important. And, I suggest some simple ways to have less crowded storage.

## **Disposal of Chemicals**

In this section, I present the concept and practice of a chemical management system. It begins with assuming responsibility. Then, I discuss determining hazard, inventory, purchasing philosophy, avoiding waste formation, obeying the law, and selecting a vendor. This section concludes with teaching the home application.

## **Safety Equipment Display**

LSI always has a suitcase full of safety equipment which we bring with us to seminars and short courses. At the seminar, we play a game, "Can you identify these". At the short courses, I discuss the application and use of some of the pieces in the collection.

## **Needs Assessment**

Who's responsible for safety? How do we conduct facilities inspections? The short course notebook contains several checklists including a five-page lab inspection guide. In addition, now there's a model lab to inspect with over 50 errors to be spotted.

## **Employee or Student Involvement**

How do you get others involved in the safety program? In this section, I'll discuss some of the principles and a wide variety of ways to do it. At the beginning of the course, Ed Ochoa from El Paso asked how to convince others that safety is important. More than 25 ways were suggested throughout the short course and in this section.

## **Safety Program Planning**

It takes a lot of things to have an effective safety program. Join the course participants in a group discussion to improve their lab safety program. Then, I present my five top characteristics for an effective program. You'll learn about the one thing, which causes more accidents and injuries than anything else.

## **A Condition of Employment or Acceptable Behavior**

This short section is one the most important in the whole course. Here, I provide some solid reasons why working safely must be a condition of the classroom. That's right students need to be discharged from your classroom that don't follow the safety rules.

## **Concluding Comments**

After the course participants complete an evaluation, I have some summary and concluding comments. *Since you won't be there any questions you have can be answered by emailing [info@labsafetyinstitute.org](mailto:info@labsafetyinstitute.org).*