Developing a safety synergy in the chemistry department at Stanford University

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• Discuss the tiers of safety training at Stanford University for undergraduates and graduate students.
• Describe the hands-on approach and modules for the new graduate student training.
• Outline the objectives for the undergraduate modules.
• Compare the content to illustrate the synergy between the two modules.
REQUIRED FOR ADMITTANCE:

- Stanford Issued Eye Protection
- Long Pants and Long Sleeve Shirts
  - Closed-Toe Shoes
- Stanford Issued Laboratory Coat

ALL skin must be covered except head and hands

Failure to meet requirements will result in immediate dismissal.
The Tiers of Safety Training

- Tier I: General Safety Training
- Tier II: Chemistry Safety Training
- Tier III: Advanced/Lab Specific Safety Training
Implement & Follow safety policies.

Graduate Student Training
What were the goals of this approach? What were the outcomes?
The key question to ask is what could be done differently to increase retention and preparation for teaching?
Current Model

- **Powerpoint 1**
  - Tier 1 Content

- **Powerpoints 2 and 3 (abbreviated)**
  - Tier 2 Content

- **Hands-on Modules and Discussion**
  - Tier 3 Content
Modules

Topics
1. Compressed Gas Cylinder Training
2. Chemical Spills and Clean Up
3. PPE
4. Hat Scenarios
5. Pressurized Systems
6. Fire Extinguisher Training
7. Safety Shower Demo
Structure of Modules

• Scheduled in a 2.5 hour block during TA training
• Rotation Format
• Each module is 30 minutes.
• Small Groups are emphasized
• Multiple Instructor format
• Discussion is encouraged.
Undergraduate Student Training

Understand & Follow Safety Policies
Undergraduate Training

- Available online and must be completed each year to complete undergraduate laboratories.
- The online server provides a completion summary.
- The training is complete with content, voice over, and quiz questions.
- Generally takes about 25 minutes to complete.
- Content outlines safety guidelines which graduate students are instructed to implement.
Organization

Before Lab

Arrival at Lab

During Lab and Clean Up
Gloves

• Wear safety glasses and a lab coat at all times in the lab. When conducting experiments wear gloves at all times except when leaving the lab or when touching door handles or using common equipment.

• Remove and discard immediately if the gloves become contaminated and thoroughly wash hands after removing the gloves.

Gloves can be discarded in the trash can unless saturated with chemicals, and in those cases, the gloves should be discarded in the solid waste container and an entry should be made identifying the date and chemical contaminant.
Working Safely in the Lab

• Always follow instructions provided and never work on unauthorized experiments. Always ask for help when needed.

• When working with organic reagents, acids/bases, and toxic reagents use the fume hoods (shown below) to control exposure.

Tips:
• Keep sash closed as much as practical for increased safety and energy conservation
• Do not raise the sash above the arrow marking safe operating level except during setup
• Keep chemicals at least 6 inches away from the front of the hood to ensure effective capture of contaminants
Quiz Question

Select the best response:

If you burn your hand on the hot plate, what is the appropriate course of action:
1. Ignore it
2. Contact TA
3. Contact Maria Acoba: Lab Manager of the Undergraduate Labs
4. Complete the SU-17B form if necessary

A. 1
B. 2
C. 2 & 3
D. 2, 3, and 4
Cleaning Up in the Lab

• Hazardous waste containers are provided. Choose the correct container for chemical waste, broken glass, or other sharps. Consult a TA for assistance.

Close the tops on the waste containers after use.

Please ensure not to overfill containers and cap funnels after use.

Broken Glass Container. Dispose of pipettes only after rinsing with ethanol. The rinse should be disposed of in organic waste.

Sharps container for Needles.
Quiz Questions

Mark items A-C as True or False?

A. Solvents can be left to evaporate in the fume hood or benchtop. **False**

B. All waste must be placed into hazardous waste containers unless explicitly instructed otherwise by TA. **True**, only approved quantities of non-hazardous liquids or solids can be disposed down the drain or in trash.

C. Gloves and paper towels can be deposited into the trash can if not contaminated with chemicals. **True**
Synergy

- PPE
- Emergencies
- Handling & Disposal
- Identifying Hazards