

# How To Train With Nothing

## *A Thrifty Approach to Graduate Student Training*

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**EAP**

# The Challenge



**New Graduate Students who *need*  
Safety Training**

**Zero Budget**



# What would we like them to learn?



- Fire
- Exposure
- Spills





# What else?

- General lab safety



- Medical emergency



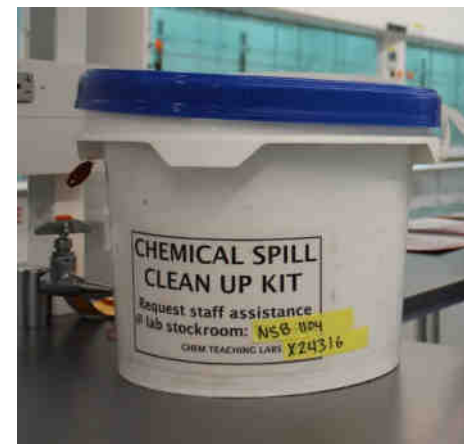
# Resources

- Lab space
- Fire extinguisher simulator
- CPR dummy
- AED simulator



# Materials

- PPE
- Spill clean up supplies
- Lab supplies
- Smoke generator





# Fire Extinguisher Training

- Presentation
- Simulator demo
- Group participation



# CPR/AED Training

- CPR Dummy
- Compression only CPR
  - Stayin' Alive
- AED simulator



# Spill Clean Up

## Steps:

1. Recognition & Notification
2. Hazard identification
3. Review clean up materials
4. Spill clean up
5. Waste management & disposal





# Fume Hoods



- Fume hood testing/certification
- Use training
- Smoke capture
  - Standard working conditions
  - Various sash heights
  - Disturbed/overcrowded hood



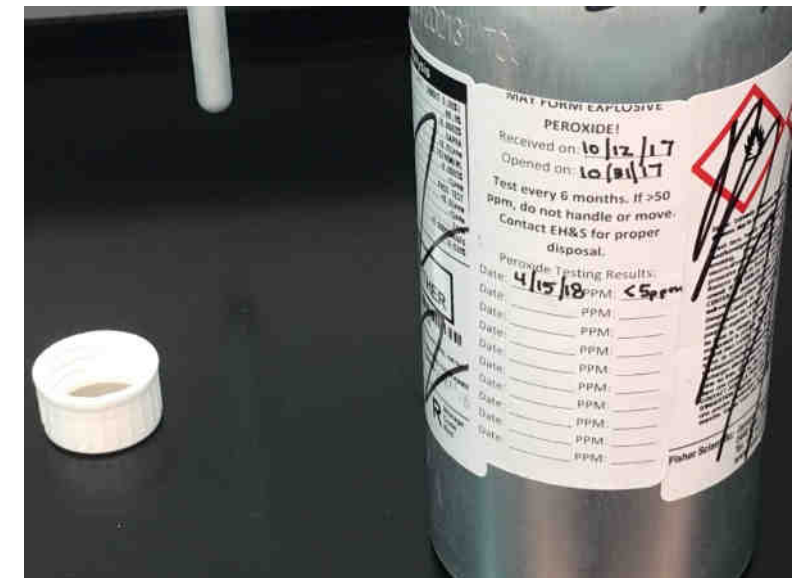
## Common audit findings

- Physical hazards
- Waste management
- Compressed gasses



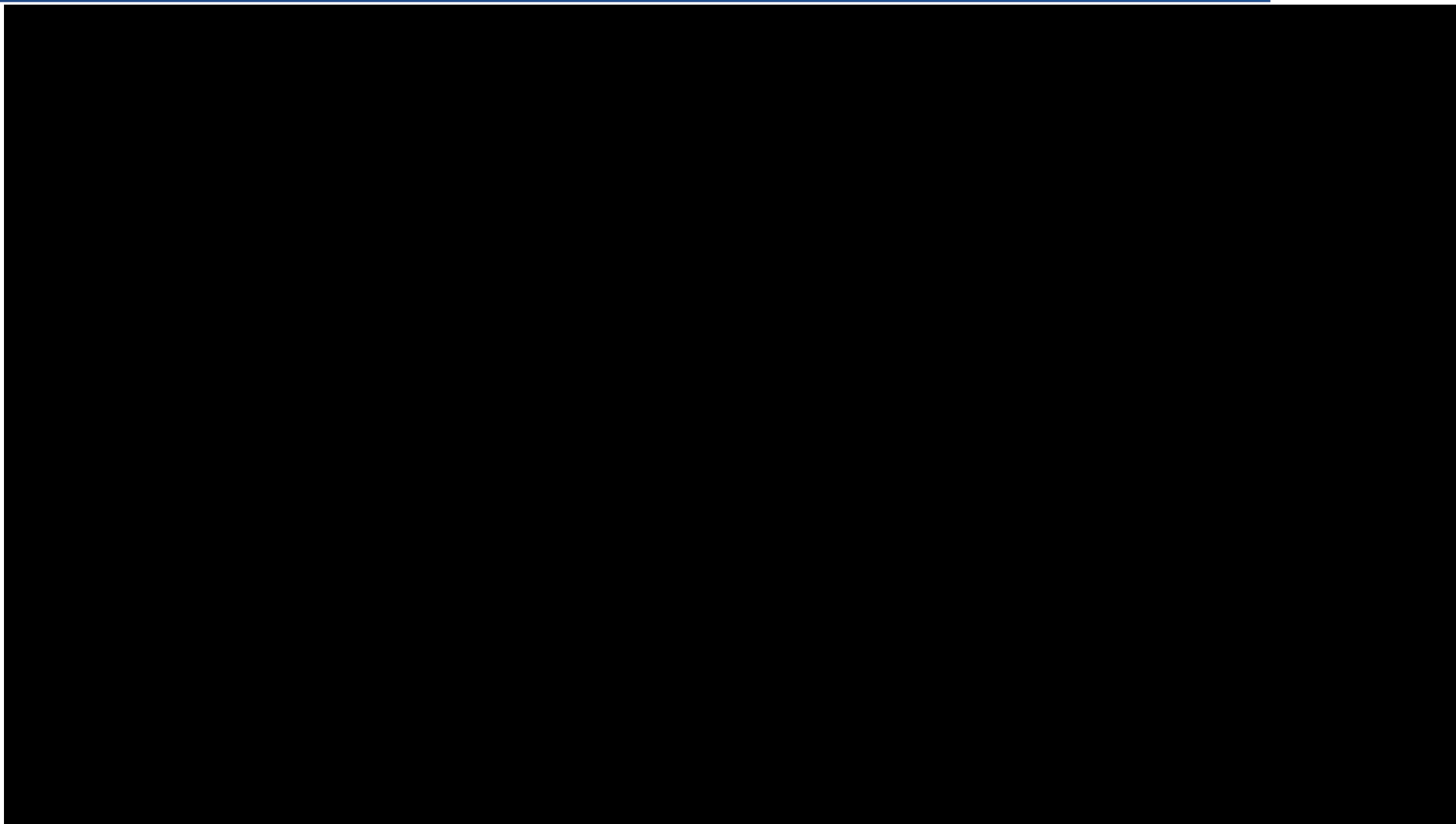
# Lab Audit cont

- Chemical spills
- Blocked safety equipment
- Peroxide testing
- Exposed sharps
- Broken glass/sharps waste

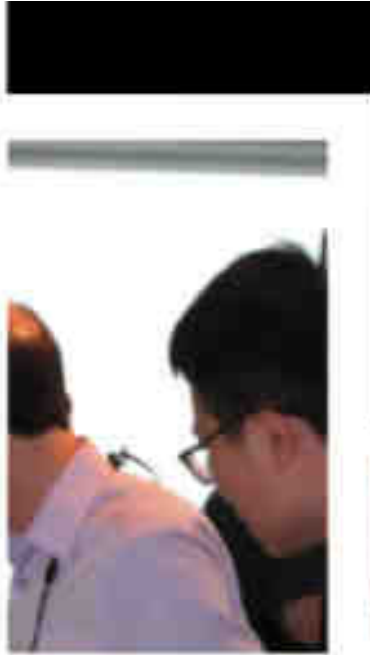




# UCR's Solution: Pair Up!



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- *Fire Extinguisher Training*
- *Lab Hazard Assessment*
- *PPE Fitting*
- ***Supervisor Safety***
- ***Safety Culture***
- *Compressed Gas Cylinder Safety*
- *Ergonomics in Computational Labs*
- *Electrical Safety*
- ***High Hazard Materials***
- *Chemical Lifecycle & Hazardous Waste*

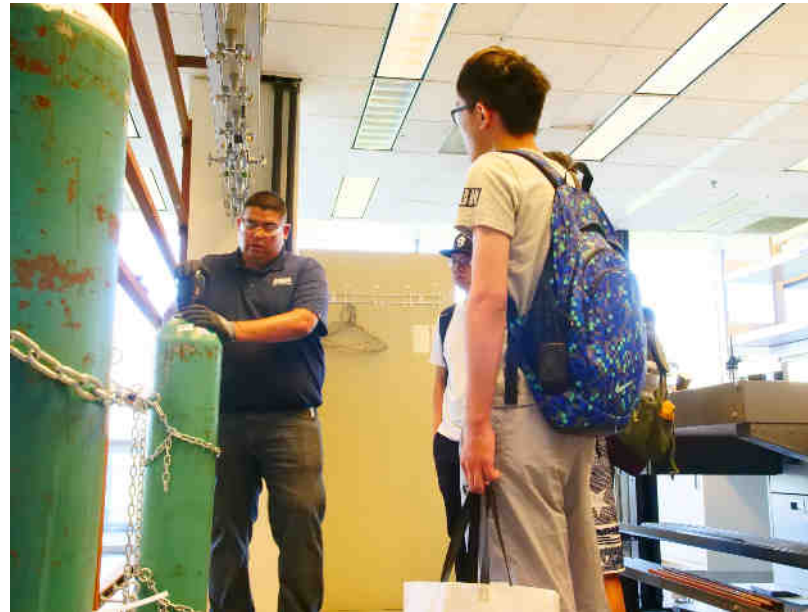
**Zero Dollar  
Hands On  
Sessions**



# UCR's Solution: Pair Up!

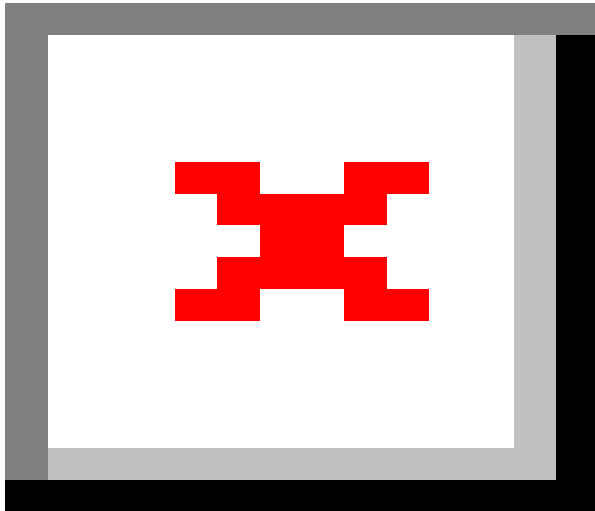
***Compressed Gas Safety***  
Air Gas Representatives &  
MSE Lab Safety Officer

**\$0**



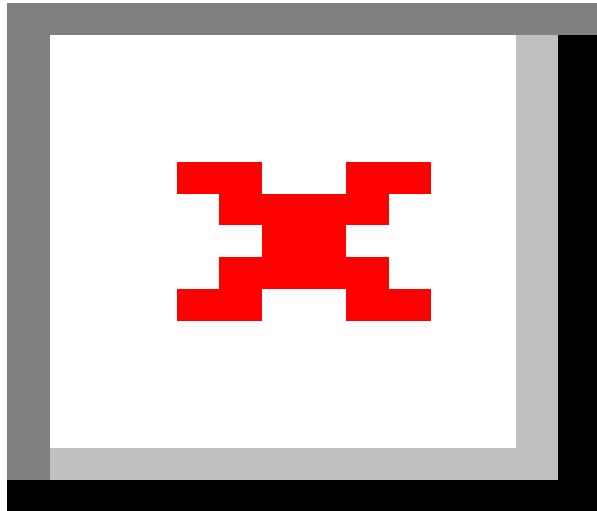
# Chemical Storage & Compatability







# Fire Extinguishers



# Leveraging Resources: On Campus



Chemistry & Biochemistry

EH&S

Recreation Department



EH&S

College of Engineering

Chemistry Department

Office of Emergency Management

Human Resources: Ergonomics

# Leveraging Resources: Industry



**Grainger**  
PPE & Safety Fair

**Mission Linen**  
PPE Fitting

**Air Gas**  
Compressed Gas Safety

**Matheson**  
High Hazard Materials



# Leveraging Resources: Industry



\$0

# Use what You've Got!

*Pair up Instructors from multiple departments*

*Use your Industry Vendors*

*Use existing space*

*Use existing Orientation dates*

# Tips & Tricks

## **Make it like a Symposium**

- > *Use a Planning Committee*
- > *Brand Your Event!*
  - > *No Marketing Team? Try Canva.com*

## **Make Activities Hands On**

## **Double it up as a Safety Fair**

- > *Contact your Safety Supply Vendors*

## **Give out freebies when you can!**

- > *PPE*
- > *Food*
- > *Vendor Freebies*



# Benefits

**Improving  
Safety  
Culture**

## Fume Hood

There are two fume hoods. Start this section in the **hood that is cluttered** with objects. Perform the and answer the questions.

- When was the last test on the hood performed?

Lower the glass sash almost all the way down, allowing for a **couple of inches of a gap** for airflow. held smoke generator approximately 10–12 inches away from the front of the hood but at the same let between the sash and surface of the hood. Slowly and gently, sweep the smoke generator across the w once or twice.

- What happens to the smoke?

Lift the sash to **match the height of the arrow** on the testing sticker, move the smoke generator to a between the benchtop and the sash, keeping it about 10 inches from the face of the hood. Gently pass t from side-to-side.

- What happens to the smoke?

While keeping the smoke generator in the same position as the previous step, **lift up the sash as hig**

- What happens to the smoke with the sash all the way up vs. at the height of the test sticker?

**Keep the sash all the way up**, move the smoke generator down near the bottom of the hood and gen and forth. Move the smoke generator closer to the front of the hood, within an inch or so, and gently s generator in front of and around the objects in the front of the hood.

- What happens to the smoke around objects? (Note: when using equipment in a fume hood, it sh inches back from the opening.)

**Move to the second hood**, the cleaner, clutter-free fume hood. Perform the following operation whi good technique in working inside a lab fume hood while using an **appropriate sash height** and wor from the face for the individual performing the manipulations. While one person is measuring out **mu team member can generate smoke** from about 10 inches away around the person's arms and all ob behavior.

- Measure out 1 teaspoon (approximately 10 grams) of citric acid, monohydra to the Erlenmeyer flask.
- Transfer roughly 100 mL of acetone to the Erlenmeyer flask.
- Stir for 15 seconds with the magnetic stir bar and stir plate.

## Spill Cleanup

At this station, you will participate in a chemical spill cleanup drill in which you will be expected to isolate the spill area and take appropriate measures based on the type and quantity of material spilled.

A low-risk spill, where laboratory personnel fully understand the hazards and risks involved, will be presented. In order to be classified risk spill, adequate spill control materials are at hand; proper personal protective equipment is available; and workers have been trained cleanup procedures.

As a guideline, a low-risk spill can be thought of as 1 L or less of flammable liquid, concentrated acid or base, or 100 ml or less of a par hazardous substance.

A clearly marked container of corrosive liquid has spilled and/or is leaking.

Respond to the spill by demonstrating the following techniques:

- Isolate the area and communicate the spill to others
- Shut off nearby ignition sources (if applicable)
- Wear appropriate PPE
- Stop the flow of the leaking chemical (if safe to do so)
- Prevent the spill from reaching drains
- Quickly encapsulate and/or absorb the spill using available materials
- Transfer chemicals from damaged/leaking containers (if possible)
- Thoroughly clean the area with detergent and water
- Prepare all cleanup materials for disposal (via submission to EH&S for pick-up)

- Describe your process of cleaning up the spill at this station.
- How is the cleanup process different for a corrosive versus flammable spill?
- How would the cleanup process change if the identity of the spilled chemical was unknown?

## Lab Self-Assessment

You will be conducting a "self-assessment" of this training laboratory. Please identify as many safety deficiencies as you can by **marking the appropriate shaded box**. Items that have been pre-marked as "NA" do not apply to this space, although they may apply to your actual lab. If you find a safety deficiency that is not listed here, you **may record it on the bottom of the next page**.

**Please do not attempt to correct any identified findings so that other groups may find them as well.**

	Yes	No	N/A
<b>LABORATORY MANAGEMENT</b>			
1. Laboratory personnel are familiar with, and know how to access, the Chemical Hygiene Plan and the Lab Safety Manual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Written HCPs have been developed to cover specific laboratory operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Laboratory-specific safety training has been provided and documented.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. SDSs and other hazard information are <u>available</u> and personnel know how to access them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. A current inventory of chemical, biological, and radiological hazards is readily available.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>GENERAL LABORATORY SAFETY</b>			
6. Lab emergency contact information is posted at lab entrance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Warning signs are posted to designate specific hazards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Aisles are clear and without tripping hazards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All exits are free and unobstructed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Appropriate safety eyewear, gloves, lab coats, and other personal protective equipment is available and used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CHEMICAL LABELING AND STORAGE</b>			
11. Chemical containers are labeled with the content identity and hazard warnings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Chemicals are segregated by major hazard categories and incompatibles are separated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Peroxide forming chemicals are dated and tested at least annually.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Flammable and combustible liquids storage volumes are minimized and stored in flammable storage cabinets or safety cans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Compressed gas cylinders are properly secured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Compressed fuel gases are separated from oxidizing gases.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Flammable and toxic gases are stored and a well-ventilated area with highly toxic gases stored in a ventilated enclosure.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Training Resources

## Graduate Student Safety Orientation Seminar

### Workshop Planning Worksheet

September 26, 2018 | 9:00am – 4:00pm

Workshop Title: \_\_\_\_\_

Name(s) of presenters: \_\_\_\_\_

Supplies (you will be bringing):

Examples: Fire extinguishers, hazard stickers, sharps containers, GM meters, pH food thermometer, etc.

Requests for equipment (you need us to provide):

Example: Pen, paper, electrical outlet, copies, etc.

Description (1 paragraph describing activity):

Example: Participants will use a fire extinguisher to put out an electronic fire.

#### Objective

By the end of this session, participants will be able to:

Example: Use the PASS technique when operating a fire extinguisher.

#### Workshop Agenda: 30 Minutes

1. Welcome & Sign-In (5 min) v
2. Activities (20 min)
  - a.
  - b.
  - c.
3. Review (5 min)

## Graduate Student Safety Orientation Seminar Evaluation

September 26, 2018 @ University of California Riverside

Instructions: Please complete and return to Registration Table to Check out and Receive Training Credit for today's event.

What is your overall REACTION to the program?



The course affects the way I do my work. (check one)

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

What are 2-3 things you've learned from this workshop?

- 1.
- 2.
- 3.

Please feel free to identify more than three items on the back (optional).

Rate the quality of each workshop/activity

	Good	Neutral	Poor	NA
Lab Risk Assessment				
Fire & Life Safety (Fire Extinguishers)				
Chemical Lifecycle & Hazardous Materials				
Personal Protective Equipment (PPE)				
Compressed Gas				
Supervisory Skills				
Electrical Safety				
High Hazard & Dangerous Materials				
Safety Culture at UCR				
Safety Fair				
Lunch				

## Contact Information

(optional)

Name:

Email:

Comments:

## Summary Report

September 26, 2018

University of California Riverside

Prepared by: Heather Davis, Training Coordinator

### Background

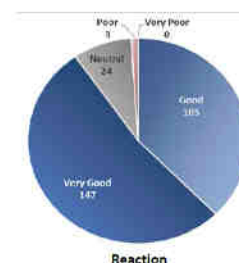
The Graduate Student Safety Orientation Seminar for the Marlan and Rosemary Bourns College of Engineering and UCR Chemistry Department took place on **Wednesday, September 26<sup>th</sup>** from **9:00am – 4:00pm**. All first-year graduate students were required to attend and additional invitations were given to others, such as second years as well as undergraduate researchers working in the labs, as determined by departments. The event was a collaboration of the efforts of Environmental Health & Safety, the Laboratory Safety Officers from Electrical & Computer Engineering, Materials Science & Engineering, Bioengineering, Chemical & Environmental Engineering, Computer Science & Engineering, Mechanical Engineering and the Chemistry Department. The Seminar consisted of a series of training topics to address safety in a research environment. Students were assigned a set of topics to complete based on the nature of their work and the hazards they may come across. Session topics included: Fire & Life Safety, Laboratory Hazard Assessment, Chemical Lifecycle and Hazardous Materials, Personal Protective Equipment, High Hazards and Dangerous Materials, Compressed Gas Safety, Electrical Safety, Safety Culture at UCR, Ergonomics for Computation Labs and Supervisor Skills.

### Course Evaluations

Training is evaluated largely in terms of participant's **reaction** (e.g., thoughts and feelings), **behavior** (e.g., transfer of learning to the job), **learning** (e.g., change in knowledge and skills), and/or results.

### Reaction

Evaluation of reactions enables the program to examine how well participants like the learning process. Reactions provide an indicator of course quality and overall satisfaction. Total evaluations collected: 287 (291 attendees recorded)



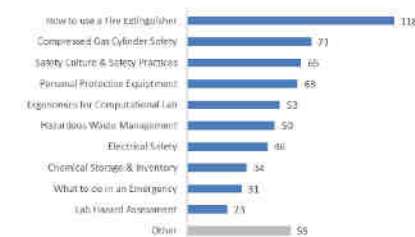
Reaction

What is your overall reaction to the program?

90% of participants indicated that workshop was either "Good" or "Very Good". Only 9% of participants indicated a "Neutral" reaction and 1% indicated a "Poor" reaction.

### Learning

Evaluation of learning enables the program to examine the extent to which participants gained skill or knowledge. Learning metrics provide an indicator of the effectiveness of training in increasing knowledge or skill.



\*Other includes: UCRPD Contact Information, using SDS and SOPs, Supervisor Skills, High Hazard materials, Contacting EH&S and other Campus Resources, proper glove removal.

### Top 10 Learned Concepts & Skills

What are 2-3 things you learned from this workshop?

Attendees most frequently recalled learning how to use fire extinguisher (19%). Participants also indicated that they learned: Compressed Gas Cylinder Safety (12%) and the importance of Safety Practices and Safety Culture at UCR (11%).



# Training Resources



**Reusable Props**  
*Create the prop once and use it over and over! Plus, easy clean up!*

# Let's Play a Game..



**Need two volunteers**

*Choose a “profile” (SDS)*

*Introduce yourself to your partner and  
read your characteristics to one another.*

**What do you think?**

*Are you two compatible?*

*Can you swipe right and store together?*

*Or will you need to swipe left and go your  
separate ways?*

*What happens when someone new gets  
into the mix...*

# Contact us!



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