



**Civil Engineering Department**

**College of Engineering**



# **General Lab Safety Training**

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# OBJECTIVES

- Safe Workplace
- Risk assessment.
- Laboratory hygiene.
- Required PPE.
- Hazard Identification
- Safe working practices.
- Sustainable Waste Disposal
- Emergency response.

# GENERAL SAFETY RULES

- **Lab safety** is everyone's **responsibility**.
  - Lab safety policy and procedures **MUST** be strictly followed.
  - You **MUST** perform **RISK ASSESSMENTS**.
- Safe working protects:
    - You
    - Other lab workers
    - Cleaners
    - Visitors
    - Your work

## KEY POINTS

- Conduct a **risk assessment** for each experiment.
- Select **appropriate safety** measures.
- Maintain a **safe** laboratory environment.
- Prepare for **emergencies**.

# Precautionary Measures in lab

## DO'S

- **Eye Protection**
  - ✓ **Safety glasses** – flying particles, chemical splashes, dust
  - ✓ **Splash goggles** – corrosive liquids, solvents, powders
  - ✓ **Face Shields** – high pressure system
- **Respiratory Protection** – normally not needed
- **Skin and Body Protection**
  - ✓ **Gloves** – see the MSDS
  - ✓ **Aprons and lab coats** – strong acids and bases
  - ✓ **Shoes** – always worn in lab, closed toe and closed heel
- **Hearing Protection** – normally not needed
- Remove and wash contaminated **clothing** promptly
- Use in **well-ventilated** areas

## DONT'S

- **Breathe** vapors
- **Use** damaged glassware
- **Store chemicals** near heat, sunlight, or substances with which they might react
- **Store materials** on floors or other places where people could trip over them
- **Leave** equipment unattended when its operating
- **Put** custodians and fellow workers in danger
- **Keep** away contact of clothing with chemicals and other combustible materials
- **Keep** contact with sparks, heat, and flame



# LABORATORY HYGIENE

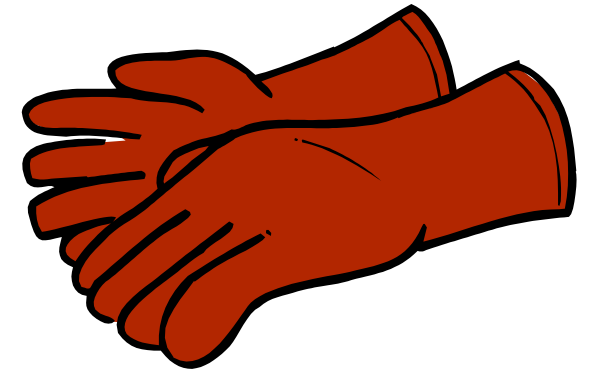
- Never eat, drink or smoke in a laboratory
- Never apply cosmetics
- Never touch your face, mouth or eyes
- Never suck pens or chew pencils
- Always wash your hands before you leave
- Roll up loose sleeves.
- Keep your workplace tidy
- Clear up waste, deal with washing up and put things away as you finish with them
- Make sure everything is safe before you leave things unattended
- A tidy laboratory avoids accidents to everyone



# Personal Protective Equipment (PPE)

## ■ Always use appropriate clothes and personal protective tools:

- Lab coat.
- Safety goggles.
- Masks.
- Gloves.
- No open shoes.
- No eye lenses.



## ■ Know the location of:

- Fire extinguisher and fire blanket.
- Shower and eyewash stations.
- First aid kit.



# HAZARD IDENTIFICATION

- Fire
- Breakage of glassware
- Sharps
- Spillages
- Pressure equipment & gas cylinder.
- Extremes of heat & cold
- Chemical hazards
- Biological hazards
- Radiation



Explosive



Flammable



Oxidising



Gas under pressure



Corrosive



Acute toxicity



Health hazard



Serious health hazard



Hazardous to the environment



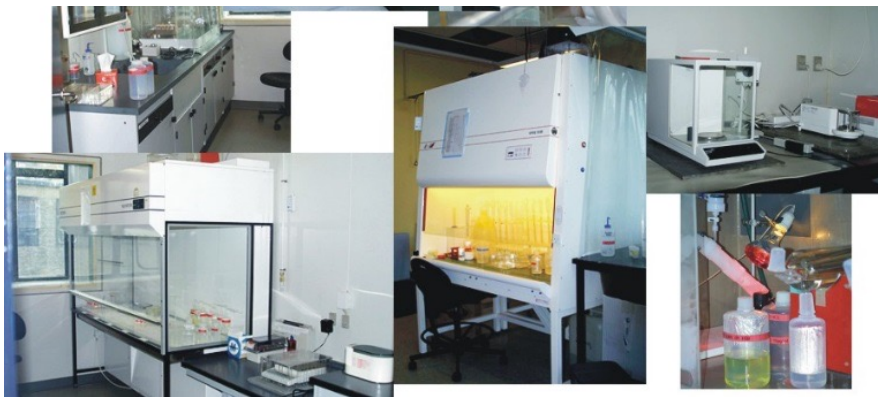
# General Health Hazards

- Toxicity
- Corrosivity (acids and bases)
- Ignitability (flammable solvents and certain solids)
- Reactivity (sodium and various water-reactive reagents)
- Sensitivity
- Carcinogenic

# SAFE WORKING PRACTICE

## LABORATORY EQUIPMENT

- Never use any laboratory equipment unless you are trained & have been authorised to do so
- As well as injuring yourself you may cause very costly damage



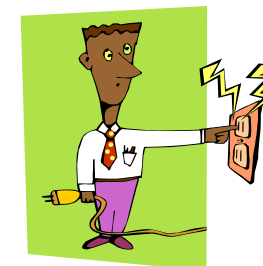
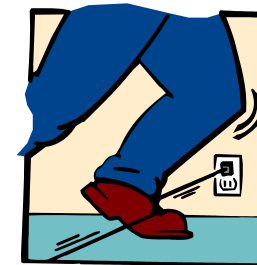
## GLASSWARE

- Use correct techniques for the insertion of tubing onto glassware
- Never use glassware under pressure or vacuum unless it is designed for the job and suitably shielded
- Dispose of chopped or broken glassware – it is a risk to you and others
- Always dispose of broken glass in a glass bin or sharps bin



## ELECTRICAL EQUIPMENT

- Always do a visual check on electrical equipment before use
- **NEVER** use defective equipment
- Lay electrical cords where no one can trip on them.
- Be sure your hands and your lab area are dry before using electrical equipment.
- Unplug cords by pulling the plug, not the cord.



# Chemical Labs

- Labs have established separate storage areas for
  - ✓ Flammable and combustible organic liquids and solvents
  - ✓ Acids
  - ✓ Dry salts, and oxidizers
  - ✓ Bases
- Chemicals are stored in
  - ✓ Chemical storage cabinets
  - ✓ Flammable storage refrigerators (No food)
  - ✓ Chemical storage refrigerators/freezers (No food)
  - ✓ On shelves with retaining barriers



# WASTE DISPOSAL

- Do not put materials down the drain or in with normal waste unless authorised to do so
  - Solvents and oils must be segregated into the correct waste bottle or drum
- Put aggregate and cementitious materials separately in bin bags



**General waste**

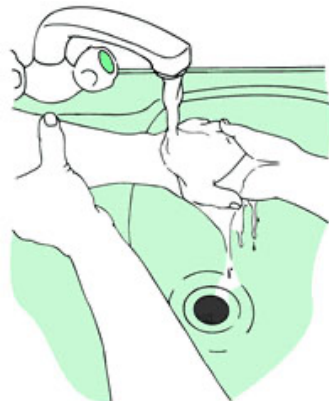


**Sharpe materials**

# EMERGENCY RESPONSE

## FIRST AID

- All laboratory workers should undergo simple first aid training
  - For **ALL** chemical splashes, wash with plenty of water for 10 minutes
  - Control bleeding with direct pressure, avoiding any foreign bodies such as glass
- Report all accidents to your supervisor or departmental safety officer



## EMERGENCY CONTACTS

| LIST                                 | PHONE NUMBER |
|--------------------------------------|--------------|
| Head of Civil Engineering Department | 8151         |
| Fire Emergency                       | 998          |
| Police                               | 999/ 911     |
| Ambulance                            | 997          |
| Dawadmi General Hospital             | 011 642 1175 |

***THANK YOU***