Introduction to Laboratory Safety

Course instructor: Jibril H. Yusuf PhD.

E-mail: jibril.habib@tiu.edu.iq

Assistant: Ms. Lavan Ali

Course: **General Biology I** (MA 101)

Fall Semester (2025)

Week 1

Date 16-12-2025

Outline

- What is Laboratory safety
- Importance of Laboratory Safety
- General Laboratory Rules
- Common Laboratory Hazards
- Safety Equipment & Use
- Proper Waste Disposal
- Emergency Procedures

Objectives

❖By the end of this lecture, students should be able to:

1. Understand the importance of safety in the biology laboratory.
2. Identify common laboratory hazards.
3. Follow proper safety procedures to prevent accidents.
4. Use safety equipment correctly.
5. Respond appropriately to emergencies.

❑ What is Laboratory safety?

➢Is the set of **rules**, **practices**, and **behaviors** designed to prevent **accidents**, **injuries**, and **contamination** while working in a laboratory.

❑ Importance of Laboratory Safety

- Is essential to ensure that scientific work is carried out without **harm to people**, **equipment**, and **the environment**.

1) Maintaining a safe environment protects students, staff, and the integrity of experiments.

2) Safety ensures compliance with institutional and legal regulations.

❖ General Laboratory Rules:

1. Personal Conduct:

- No eating, drinking, chewing gum, or applying cosmetics in the lab.

- Avoid horseplay, running, or distracting others.

2. Clothing & Personal Protection Equipment (PPE):

- **PPE (Lab Coats , Gloves and Safety glasses)**

Must be worn at all times in the laboratory to reduce the risk of injury and exposure to hazardous materials.

2. Clothing & Personal Protection Equipment:

- Tie back long hair and avoid loose clothing.
- Closed-toe shoes are mandatory.

3. Equipment & Chemicals:

- Handle all instruments carefully; return them to designated places after use.
- Read labels carefully and follow instructions when using chemicals.
- Do not taste or directly smell chemicals; use proper wafting technique.

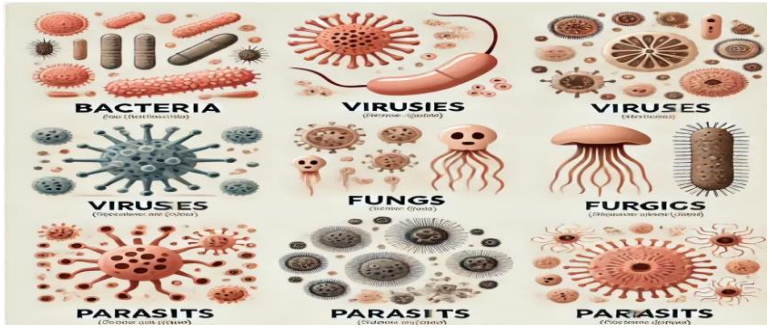
❖ Common Laboratory Hazards:

1. Chemical Hazards:

Acids, bases, disinfectants, and stains may irritate skin or eyes.

2. Biological Hazards:

Microorganisms, plant or animal tissues may carry pathogens.



3. Physical Hazards:

Sharp instruments (scalpels, needles), glassware, or hot equipment.

4. Electrical Hazards:

- Bunsen burners, hot plates, and power cords.

❖ Safety Equipment & Use:

1. Fire Extinguisher: Extinguish small fires.

- **How to Use:** Pull pin, aim at base, squeeze handle, sweep side-to-side

2. Eyewash Station:

- Rinse chemicals from eyes.
- **How to Use:** Hold eyes open, rinse for 15+ min

3. Safety Shower:

Rinse large spills on body

How to Use: Pull lever, remove contaminated clothing

4. First Aid Kit:

- **How to Use:** Use as instructed by lab supervisor.

5. Fume Hood:

Handle volatile chemicals, work inside hood.

Proper Waste Disposal:

1. Chemical Waste:

Dispose in labeled containers, never down the sink unless instructed.

2. Biological Waste:

Use biohazard bags for cultures or contaminated materials.

3. Glassware & Sharps:

Broken glass in designated sharps container; never use bare hands.

➢Emergency Procedures:

1. **Fire:** Evacuate calmly; use fire extinguisher if safe.
2. **Spills:** Notify instructor; contain and clean using proper protocol.
3. **Injury:** Report immediately; provide first aid if trained.
4. **Chemical Exposure:** Flush affected area and seek medical attention.

References

1. Campbell, N.A. et al. (2020). Biology (12th ed.). Pearson Education.
2. Mader, S.S. (2022). Biology (14th ed.). McGraw-Hill Education.
3. Raven, P.H., Johnson, G.B. et al. (2021). Biology (12th ed.). McGraw-Hill
4. Principles of Biology

Thanks