Regulatory Authority

- **Nuclear Regulatory Commission (NRC)**
  EPA, DoE, DoT, OSHA

- **Agreement State**
  Arkansas Department of Health
  Radiation Control and Emergency Management

- **UALR Radiation Safety Office**
  Radiation License- commitment to provide personnel training
Individuals Requiring Radiation Safety Training

Three general categories of UALR employees with respect to their exposure to radiation:

- **Radiation Workers**: Those workers whose major responsibilities involve working with sources of ionizing radiation or radioactive material as part of their work.

- **Ancillary Workers**: All personnel who may come in contact with or enter an area that contains radioactive material or sources of ionizing radiation.

- **Non-Radiation Workers**: Personnel who would not normally be expected to encounter radioactive material or radiation sources in the course of their employment at UALR. This group does not require radiation training.
Radiation Safety Training for Ancillary Personnel

Any individual who works near areas where radioactive material is used or who may have reason to enter such an area must participate in a one hour awareness training session provided by the UALR Radiation Safety Officer (RSO).

This training is for ancillary personnel and does not replace training for radiation workers.

All new employees working in areas containing radioactive materials are required to attend this training.
 Radiation Safety Training Contents

• What is radiation?
• Where is it located on campus?
• How to know if there is a radiation source or radiation area- Symbols?
• How to protect from radiation exposure?
• What to do in case of an emergency?

Upon completion of this training you may be authorized to enter some restricted areas containing radioactive material. However, you may not handle radioactive materials directly. A record of completion of the training will be documented with the radiation safety office.
What is Radiation?
Invisible energy waves or particles

What is Radioactivity?
The radioactivity is the property of some atoms to spontaneously give off energy as particles or rays. The atoms that make up the radioactive materials are the source of radiation.
Ionizing and Non-ionizing radiation?

- Radiation carries a range of energy forming an electromagnetic spectrum.
- Radiation that does not have enough energy to break chemical bonds but can vibrate atoms is referred to as “non-ionizing radiation” e.g. radiowaves, microwaves, infrared, visible light etc.
- Radiation that has enough energy to promote an electron from its orbit is referred to as 'ionizing radiation, e.g. alpha particles, beta particles, gamma rays etc.
Sources of Ionizing Radiation

- Naturally Occurring
- Consumer Products
- Foods and Containers
- Medical Procedures
- Nuclear Plants
- Radiological Sites
- Government & Industry
Ionizing Radiation

Penetrating Distances

- Alpha
- Beta
- Gamma and X-rays

- Paper
- Plastic
- Lead
- Concrete
Location of Radiation Areas on the Campus

ETAS Building 4th Floor
- Central Storage Facility (ETAS-577, 577A)
- Applied Science/ Bioscience (ETAS-427, ETAS-424)

Science Laboratory Building (SCLB)
- 3rd Floor – Biology (SCLB-374)
How to know if there is a radiation source or radiation area - Symbols?
How to know if there is a radiation source or radiation area - Symbols?

"CAUTION RADIATION AREA"

"CAUTION RADIOACTIVE MATERIALS"
Radiation Package Symbols
Radiation Protection Basics

- Time
- Distance
- Shielding
Protection from External Exposure

Protective Devices

Shielding
lab coats
gloves,
Masks
eye protection
proper monitoring
public perception
Protection from Internal Exposure

Mode of Entry into Body

- Inhalation
- Ingestion
- Absorption
- Injection
Tissue Damage and Health Effects

- Breakage of Chemical Bonds
- Formation of New Chemical Bonds or Cross linkages
- Damage to Macromolecules (DNA, RNA, Protein etc.)
- Production of Free Radicals
- Overexposure may cause deformity, cancer etc.
What About Disposing of Radioactive Waste?

- Disposal - a complex issue, please do not pick up any radiation waste
- Radiation Safety Officer can only dispose of radiation waste
- Proper disposal - a key to protecting public health and environment

-Different types of wastes-

  Solid, liquid, Scintillation vials
  Contamination with biohazard materials
  Short Half Life (decayed in storage facility)
  Long Half Life (disposed of by professional companies)
  Seal Sources (disposed of by professional companies or returned to the manufacturer)
Emergency Contacts

Radiation Safety Officer
501-569-8210

Assistant Radiation Safety Officer
501-569-8003

After Hours: Public Safety
501-569-3400

Also check “NRC Notice to Employees” posted in the radiation use and storage areas