

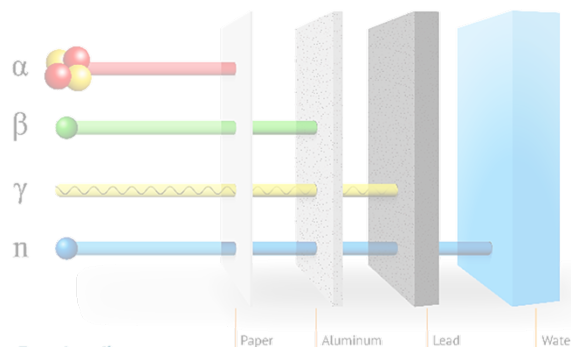
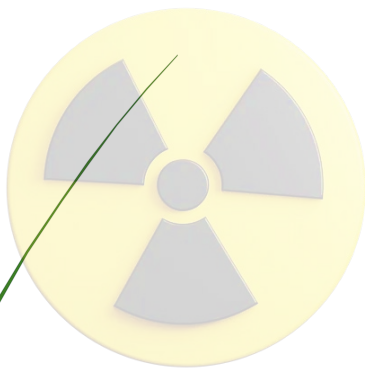
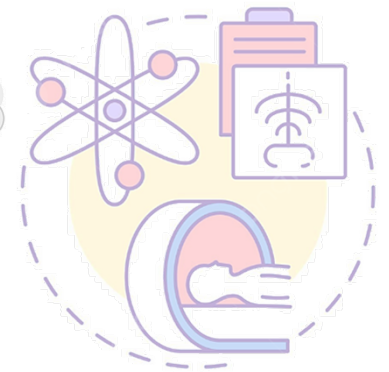
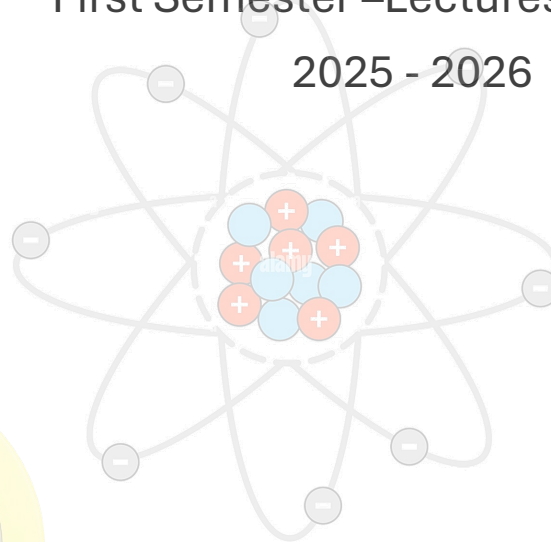


Radiation Protection

The Second Stage

First Semester – Lectures No. 7,8,9

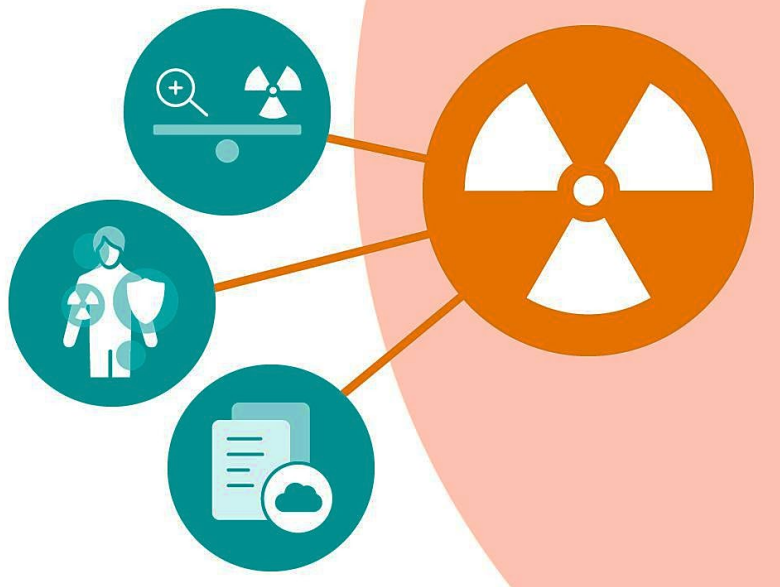
2025 - 2026



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**Radiation Hazards
Radiation Measurements
Devices & Detectors**

Radiation Hazards



OUTLINES:

- ❖ **Radiation Hazard Evaluation Devices.**
- ✓ **Area Monitoring Devices.**
- **Personnel Monitoring Devices.**



When the anode is charged to a positive potential, the charge is distributed between the wire anode and quartz fiber. Electrostatic repulsion deflects the quartz fiber, and the greater the charge, the greater the deflection of the quartz fiber. Radiation incident on the chamber produces ionization inside the active volume of the chamber. The electrons produced by ionization are attracted to, and collected by, the positively charged central anode. This collection of electrons reduces the net positive charge and allows the quartz fiber to return in the direction of the original position. The amount of movement is directly proportional to the amount of ionization which occurs.

b) The **electronic personal dosimeter**:

The most **commonly used type**, is an electronic device that has a number of **sophisticated functions** وظائف متطورة, such as **continual monitoring** which allows **alarm warnings** at **present levels and live readout of dose accumulated**. These are **especially useful** in **high dose areas** where residence time of the wearer is limited due to dose constraints. The **dosimeter** can be reset, **usually after taking a reading for record purposes**, and thereby **re-used multiple times**.



2) MOSFET dosimeter

Metal Oxide Semiconductor Field Effect Transistor (MOSFET) detectors are a semiconductor-based radiation detector used for small field dosimetry, in-vivo dosimetry, and profile measurements. The main advantages of MOSFET devices are:

- The MOSFET dosimeter is direct reading with a very thin active area (less than 2 μ m).
- The physical size of the MOSFET when packaged is less than 4 mm.
- The post radiation signal is permanently stored and is dose rate independent.
- The devices are hampered by accumulated damage limiting their effective lives to about 100Gy.