

## Unit 5 - RADIATION THERAPY AND RADIATION SAFETY

### 5.2 RADIATION MEASURING INSTRUMENTS

Radiation measuring instruments are essential for monitoring exposure to ionizing radiation in various settings. Here are details about the devices you mentioned:

#### 1. **Dosimeter:**

- A dosimeter is a portable device used to measure and record an individual's exposure to ionizing radiation, such as X-rays, gamma rays, or beta particles. There are different types of dosimeters, such as passive and active ones. They are commonly used by workers in environments like nuclear power plants, hospitals, and research laboratories.

#### 2. **Film Badges:**

- A **film badge** is a type of personal dosimeter that uses photographic film to measure the accumulated dose of radiation. When radiation interacts with the film, it darkens. After the badge is developed, the amount of darkening indicates the radiation dose received. Film badges are relatively simple, inexpensive, and commonly used for monitoring exposure over a period of time. They are most effective for detecting X-rays and gamma rays.

#### 3. **Thermo-Luminescent Dosimeters (TLDs):**

- **TLDs** are solid-state radiation detectors that use crystals, typically lithium fluoride, to measure ionizing radiation. When the crystals are exposed to radiation, they absorb energy and store it. Upon heating, the crystals release the energy in the form of light (luminescence), which is then measured to determine the radiation dose. TLDs are more sensitive and precise than film badges and are used in both personal and environmental monitoring.

#### 4. **Electronic Dosimeter:**

- An **electronic dosimeter** (or **electronic personal dosimeter**) is a modern, digital radiation measuring device that provides real-time readings of radiation

exposure. These dosimeters use sensors like silicon diodes or ionization chambers to measure radiation levels. They offer immediate feedback, are compact, and often feature alarms when radiation thresholds are exceeded. Electronic dosimeters are commonly used in workplaces where high radiation levels may be encountered, and they are often rechargeable.

