

Al Mustaqbal University
College of Technology & Health Science
Radiology Techniques Department

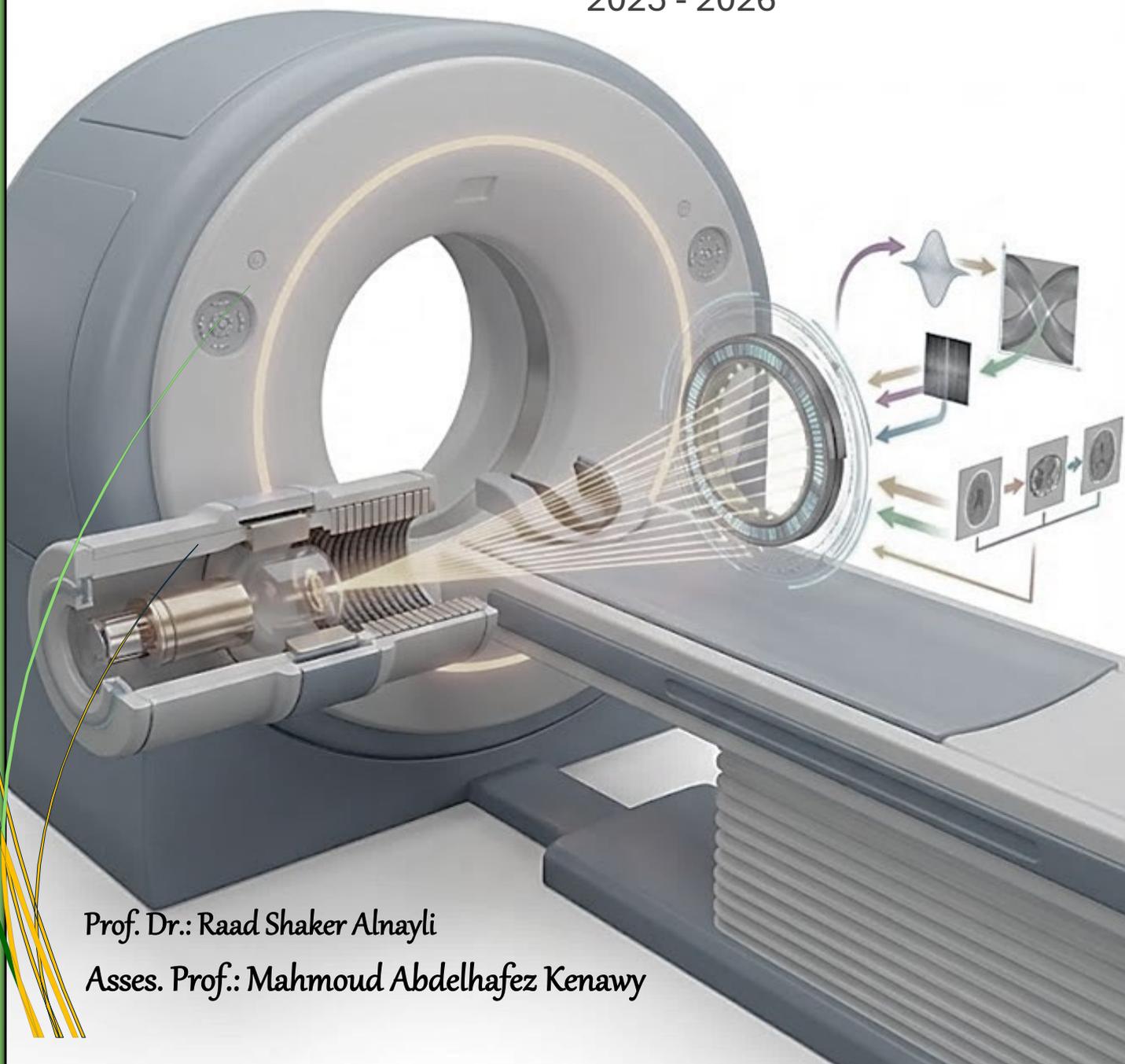


Physics of CT

The Second Stage

Second Semester – Lectures no. 3 & 4

2025 - 2026



Prof. Dr.: Raad Shaker Alnayli

Asses. Prof.: Mahmoud Abdelhafez Kenawy

Lecture information

Lecture Number: 3 & 4

Lecture Title: Hardware and Physics of Computed Tomography (CT).

Topic: Components of the CT Scanner

Target Audience: Second-year students – Radiology Techniques Department

Suggested Duration: 90 Minutes Lecture + 30 Minutes Discussion

OUTLINES: we have two sections

➤ **Section 1: Main Parts of CT Scanner.**

❖ **The Gantry.**

- * X-ray tube and its components.
- * X- ray production.
- * Detectors.
- * Detection of X-ray.
- * The milliamperere and kilovoltage generators.
- * What is the effect of milliamperere and kilovoltage in X-ray production?
- * The Slip Ring and what is its function?
- * Collimators.
- * X-ray filters (definition, important and their types in the CT machine)

❖ **Couch (CT Patient Table).**

- * Couch Units.
- * Couch Control Units.
- * Velcro Patient Immobilisation Strap.

❖ **Data Acquisition System (DAS) (definition, function and its types).**

❖ **Image Reconstruction System (IRS) (definition, function and its types).**

❖ **Operating Console and Control Units and tools in it.**

➤ **Section 2 (Practical): Some important concepts within CT imaging.**

- ❖ X- Ray production factors (Kvp, mAs).
- ❖ Field of view (FOV).
- ❖ Rotation Time (RT).
- ❖ CT Pitch.
- ❖ Slice thickness and interval.
- ❖ Image windowing.
- ❖ Image filtering.
- ❖ Image resolution.
- ❖ The tree view of reconstructed images (Axial, Coronal & Sagittal).