

# Course Specification

## (2025)

### 1. Basic Information

Course Title (according to the bylaw)	CT Technology I			
Course Code (according to the bylaw)	TRMI 301			
Department/s participating in delivery of the course	Technology of Radiology and Medical Imaging			
Number of credit hours of the course (according to the bylaw)	<b>Theoretical</b>	<b>Practical</b>	<b>Other (specify)</b>	<b>Total</b>
	1	4	-	3
Course Type	Compulsory			
Academic level at which the course is taught	Level 3 – 1 <sup>st</sup> Semester			
Academic Program	Technology of Radiology and Medical Imaging			
Institute	High Technology Institute of Applied Health Science			
Academy	Nile Delta for sciences			
Name of Course Coordinator	<b>DR. Mohamed Auf</b>			

	Ph.D. of Radiobiology, Institute of Graduate Studies and Research, Alexandria University
Course Specification Approval Date	Department Council No. 2, date: (2024 – 09 – 21)
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	

## 2. Course Overview (Brief summary of scientific content)

This course will familiarize the student with physiological irregularities and common pathologies found in CT imaging process. The course sequence will be inclusive of all commonly imaged body systems and areas.

## 3. Course Learning Outcomes CLOs

### Matrix of course learning outcomes CLOs with program outcomes Pos (ARS)

Program Outcomes (ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Text	Code	Text	Code
PO.3	Study human anatomy and pathology to understand the physiological basis of the images	CLO.1.	Understand the principles and reconstruction techniques of 3D CT scanning.
		CLO.2.	Recognize the significance of Hounsfield Units (HU) and their role in differentiating tissue densities
PO.8	Discuss the fundamentals of	CLO.3.	Describe the types, sources, and effects of

.	instrumentation components, imaging protocols, techniques and quality assurance used in different imaging modalities.		CT artifacts on image interpretation
		<b>CLO.4.</b>	Explain the key factors affecting CT image quality, including contrast, resolution, and noise
<b>PO.9</b> .	Understand mathematical and physics principles to grasp the fundamental properties of radiation and accurately orient patients for X-rays, 3-D CT imaging, ultrasounds and MRI.	<b>CLO.5.</b>	Explain the physics and technology behind advanced CT techniques such as 3D CT.
		<b>CLO.6.</b>	Discuss how physics concepts influence scan parameters, patient orientation, and 3D reconstruction techniques.
<b>PO.4</b> .	Troubleshoot technical errors and artifacts.	<b>CLO.7.</b>	Analyze how variations in HU values impact diagnostic accuracy in CT imaging
		<b>CLO.8.</b>	Evaluate CT image quality and propose optimization strategies to improve diagnostic outcomes
<b>PO.4</b> .	Operate and manage effectively the different medical imaging equipment and practice the professional fieldwork.	<b>CLO.9.</b>	Operate the CT scanner and perform routine scans safely and effectively
		<b>CLO.10</b> .	Apply the standard protocol for abdominal and pelvic CT imaging, identifying anatomical landmarks.
<b>PO.7</b> .	Gain insight into specialized imaging processes including (CT scans, interventional procedures, magnetic resonance imaging (MRI), ultrasound ...).	<b>CLO.11</b> .	Prepare the CT scan room following safety protocols and proper patient positioning
		<b>CLO.12</b> .	Administer contrast agents appropriately based on the clinical indication and scan requirements
<b>PO.1</b> .	Communicate effectively & develop collaborative relationships with all health members.	<b>CLO.13</b> .	Work collaboratively within a healthcare team during CT procedures, demonstrating effective communication.
		<b>CLO.14</b> .	Manage time efficiently during scan preparation and execution to ensure high

---

			workflow and patient care.
<b>PO.4</b> .	Adjust to new technologies and methods.	<b>CLO.15</b> .	Demonstrate the ability to learn and apply updated CT scanning protocols and reconstruction techniques.
		<b>CLO.16</b> .	Integrate newly introduced CT technologies into clinical workflow with minimal supervision.

#### 4. Teaching and Learning Methods

1. Interactive Lectures. Interactive Lectures.
  2. Discussion and brain storming.
  3. Asynchronous learning.
  4. Case study /problem solving.
  5. Self-Directed Learning (SDL).
  6. Research and presentations, Assignment and reports.
-

---

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/ Clinical/ ..... )	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined )
1	3D CT scan	3	1	2	2	-
2	HU and CT densities	3	1	4	-	-
3	CT artifacts	3	1	4	-	-
4	CT image quality	3	1	2	2	-
5	CT scan generation	3	1	2	2	-
6	Mid-Term Exam	-	-	-	-	-
7	CT Segmental and Triphasic Scan for Liver	3	1	2	2	-
8	CT Scan room	3	1	4	-	-
9	CT Contrast scans	3	1	4	-	-
10	CT Abdomen and Pelvis	3	1	2	2	-
11	CT Abdomen and pelvis anatomy	3	1	4	-	-
12	CT Image noise	3	1	4	-	-
13	AI role in CT scans	3	1	4	-	-

---

---

14	Revision	3	1	4	-	-
15	Practical Exam	-	-	-	-	-
16	Final Written Exam	-	-	-	-	-

## Course Schedule

### 5. Methods of students' assessment

*	No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
	1	Exam 1 written (Semester work)	-	-	-
	2	Exam 2 ..... (Semester work)	6	20	13.3%
	3	Assignments	10	10	6.6%
	4	Final Practical Exam	15	45	30%
	5	Final Written Exam	16	75	50%
	6	Final Oral Exam	-	-	-
	7	Field training	-	-	-
	8	Other (Mention)	-	-	-

**The methods mentioned are examples, the organization may add and/or delete**

## 6. Learning Resources and Supportive Facilities \*

*	Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course  (must be written in full according to the scientific documentation method)	Computed tomography for technologist – Lois E. Romans
		Other References	S E C T I O N A L A N A T O M Y For Imaging Professionals – 4 <sup>th</sup> edition
		Electronic Sources  (Links must be added)	<a href="http://Radiopaedia.org">Radiopaedia.org</a> , the peer-reviewed collaborative radiology resource Knowledge bank: <a href="https://www.ekb.eg/ar">https://www.ekb.eg/ar</a>
		Learning Platforms  (Links must be added)	<a href="#">BISLMS: Log in to the site</a>
		Other  (to be mentioned)	-
	Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computers, Boards and Projectors
		Supplies	-
		Electronic Programs	Ibn Al-Haytham Program
		Skill Labs/ Simulators	-
		Virtual Labs	-
		Other (to be mentioned)	Computers, Boards and Projectors

**The list mentioned is an example, the institution may add and/or delete depending on the nature of the course**