

# Course Specification

## (2025)

### 1. Basic Information

Course Title (according to the bylaw)	Bone densitometry Techniques			
Course Code (according to the bylaw)	TRMI 311			
Department/s participating in delivery of the course	Technology of Radiology and Medical Imaging			
Number of credit hours/points of the course (according to the bylaw)	<b>Theoretical</b>	<b>Practical</b>	<b>Other (specify)</b>	<b>Total</b>
	3	2	-	2
Course Type	Compulsory			
Academic level at which the course is taught	Level 3 – 2 <sup>nd</sup> Semester			
Academic Program	Technology of Radiology and Medical Imaging			
Institute	High Technology Institute of Applied Health Sciences			
Academy	Nile Delta for sciences			
Name of Course Coordinator	Dr. Amira Atef, doctor lecturer of Biology Radiation Science			

	Institute of High Technology Institute of Applied Health Science
Course Specification Approval Date	Department Council No. 2, date: (21 – 09 – 2024)
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	

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

The core element of this course serves to increase the knowledge bone densitometry techniques and to apply standard practices to assure quality performances and interpretation of bone densitometry

## 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:	
Co de	Text	Code	Text
Po s1. 1.2	Describe the normal - structure of the body and its major organ systems	CLOs1  CLOs2	-List classified according to bone shapes  Name histological structure of

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
<b>Po s1. 1.3</b>	and explain their .functions  Understand the - comprehensive knowledge of nuclear physics, plain X-ray, ultrasound, CT, MRI, contrast media, bone densitometry, interventional and .cardiovascular techniques	<b>CLOs3</b>	bone and defined bone matrix  -Describes how to use the DEXA machine
		<b>CLOs4</b>	-Understand Purpose of bone densitometry and
		<b>CLOs5</b>	contraindications for BMD test
		<b>CLOs6</b>	-Understand Bone (bone mineral density) versus BMC (bone mineral content)
		<b>CLOs7</b>	
		<b>CLOs8</b>	
		<b>CLOs9</b>	-Define Osteoporosis and characterized of disease  -State difference between osteoblast, osteocyte and osteoclast  -Discusses what it is clinical risk factors for fracture  -List bone densitometry is indicated for individuals who

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
			meet specific medical criteria  -Tell about z-score and t-score and what mean osteopenia/osteoporosis
<b>Po s1. 2.1</b>	Use computers and software to - .analyze problems	<b>CLOs10</b>	-Analyze test results of Bone mineral density and assessment of fracture risk
	Apply statistical skills and - evidence based practice in	<b>CLOs11</b>	-Distinguish the reading on the z-score for any patient and the reading on the t-score for

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
s1. 2.2	imaging data manipulation and analysis	CLOs12	any patient  -Analyze how the mechanism of bone remodeling  - Analyze difference between osteopenia and osteoporosis
Po s1. 3.1 Po s1. 3.2	Contribute to continuous quality management and .improvement   Apply quality control measures to ensure test accuracy and reliability	CLOs13	-suggestions for radiology devices used for case diagnosis
		CLOs14	-Use scientific methods to obtain the best diagnosis by analyzing data
		CLOs15	-Apply bone mineral density test
		CLOs16	-Illustrate bone mineral density, bone mineral content because this two important factors effect on osteoporotic
			-Apply several different ways to measure

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
			BMD as DEXA, P-DEXA, DPA,QCT and quantitative ultrasound
<b>Pos2.1.1</b>	Exhibit appropriate - professional behaviors and relationships in all aspects of medical .imaging practice	<b>CLOs17</b>	-Influences and interacts well with others in the workplace
<b>Pos2.1.2</b>		<b>CLOs18</b>	-High efficiency in problem-solving procedures at the individual or institutional level
<b>Pos2.1.3</b>	Ensure confidentiality, - privacy of patients' information, comfort, preparation and ethical standards in all radiology procedures	<b>CLOs19</b>	Attention to detail
<b>Pos2.1.4</b>			

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
<b>Po s3. 1.4</b>	Practice in an ethical - and professional manner consistent with relevant legislation and regulatory requirements in medical .imaging		
	Collaborate with other health practitioners (physician, patient, .families,...)  Apply standard procedures in Contrast Media, bone densitometry, CT and		

<b>Program Outcomes (ARS)</b> (according to the matrix in the program specs)		<b>Course Learning Outcomes</b> Upon completion of the course, the student will be able to:	
<b>Co de</b>	<b>Text</b>	<b>Code</b>	<b>Text</b>
	MRI		
3. 1. -4	.		

#### 4. Teaching and Learning Methods

1. Interactive Lectures
2. Discussion and brain storming
3. Case study
4. Practical Learning
5. Self-Directed Learning (SDL).

#### Course Schedule



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	Introduction to bone densitometry	3	2	1	1	-
2	Defined of bone tissue/ classification depended on their shape	3	2	1	1	-
3	composition histological structure of bone / cellular structur	3	2	1	1	-
4	bone remodeling / mechanism of bone/osteoclasts and osteoblasts	3	2	1	1	-
5	Bone (bone mineral density) versus BMC (bone mineral content)/purpose of bone densitometry	3	2	1	1	-
6	Mid-Term Exam	3	2	1	1	-
7	z-score and T-score	3	2	1	1	-
8	Function of Osteoblasts,	3	2	1	1	-

	Osteocytes and Osteoclasts					
9	Clinical and pathologic indications for bone density test	3	2	1	1	-
10	dual-energy x ray absorptiometry (DEXA)	3	2	1	1	-
11	BMD and fracture risk/ clinical risk factors for fracture/	3	2	1	1	-
12	osteopenia/osteoporosis	3	2	1	1	-
13	assessment of fracture risk	3	2	1	1	-
14	Revision	3	2	1	1	-
15	Practical Exam					
16	Final Written Exam					

## 5. Methods of students' assessment

No .	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
---------	----------------------	--	------------------	---

1	Exam 1written (Semester work)	-	-	-
2	Exam 2 ..... (Semester work)	6	20	13.3%
3	Final Written Exam	15	75	50%
	Final Practical/Clinical/... Exam	14	45	30%
	Final Oral Exam	-	-	-
	Assignments / Project /Portfolio/ Logbook	6	10	6.6%
	Field training	-	-	-
	Other (Mention)	-	-	-

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

## 6. Learning Resources and Supportive Facilities \*

<b>Learnin g resource s (books, scientific referenc es, etc.) *</b>	<b>The main (essential) reference for the course</b>  (must be written in full according to the scientific documentation method)	<b>Kenneth L. Botrager, John P.Lampignano. Radiographic Poseitioning and related anatomy ,seventh edition.2010</b>
	<b>Other References</b>	<b>Marissa Krugh,Michelle D.Langaker.Dual Energy x-ray absorptiometry.Campbell University.2022</b>  <a href="https://www.ncbi.nlm.nih.gov">https://www.ncbi.nlm.nih.gov</a>
	<b>Electronic Sources</b> (Links must be added)	<b>:Knowledge bank</b>  <a href="https://www.ekb.eg/ar">https://www.ekb.eg/ar</a>
	<b>Learning Platforms</b> (Links must be added)	<b>bislms.mans.edu.eg</b>  <a href="https://bislms.mans.edu.eg/moodle2025/">https://bislms.mans.edu.eg/moodle2025/</a>

---

		<a href="course/index.php?categoryid=87">course/index.php?categoryid=87</a>
	<b>Other</b> (to be mentioned)	-
<b>Supportive facilities &amp; equipment for teaching and learning</b> *	<b>Devices/Instruments</b>	Computer- boards and projectors
	<b>Supplies</b>	-
	<b>Electronic Programs</b>	Ibn al-Haytham program
	<b>Skill Labs/ Simulators</b>	-
	<b>Virtual Labs</b>	-
	<b>Other (to be mentioned)</b>	-

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

**Name and Signature  
Course Coordinator**

Dr/Amira Atef

**Name and Signature  
Program Coordinator**

Dr/Amira Atef

