

Form:	Form Number	EXC-01-02-02A
Course Sullaburg	Issue Number and Data	2/3/24/2022/2963
Course Synabus	Issue Number and Date	05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	06

1.	Course Title	Radiation Detection and Measurements
2.	Course Number	0342765
2	Credit Hours (Theory, Practical)	3 hours weekly (theory)
5.	<b>Contact Hours (Theory, Practical)</b>	
4.	Prerequisites/ Corequisites	
5.	Program Title	M.Sc. in Medical Physics
6.	Program Code	
7.	School/ Center	Science
8.	Department	Physics
9.	Course Level	8 <sup>th</sup>
10.	Year of Study and Semester (s)	1 <sup>st</sup>
11	Other Department(s) Involved in	
11,	Teaching the Course	
12.	Main Learning Language	English
13.	Learning Types	$\square$ Face to face learning $\square$ Blended $\square$ Fully online
14.	<b>Online Platforms(s)</b>	□Moodle ⊠Microsoft Teams
15.	Issuing Date	15/11/2024
16.	Revision Date	

## 17. Course Coordinator:

Name:	Contact hours:
Office number:	Phone number: 22023
Email:	



#### **18. Other Instructors:**

Name:
Office number:
Phone number:
Email:
Contact hours:
Name:
Office number:
Phone number:
Email:
Contact hours:

#### **19. Course Description:**

As stated in the approved study plan

The course deals with:

Radiation sources, interactions and energy deposition by ionizing radiation in matter, concepts, quantities and units in radiation physics, isotope production, measurement and activity, standards, spectrometry, measurement technique and detectors, precision, errors, detection limits, radioanalytical methods, principles and methods of radiation dosimetry, radiation dosimetry fundamentals, radiation detection instruments.

**20. Program Intended Learning Outcomes:** (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

- 1. To be able to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
- 2. To be able to formulate or design a scientific system, process, procedure or program to contribute achieving scientific desired needs.
- 3. To be able to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
- 4. To be able to communicate his/her scientific contributions effectively with a range of audiences.



- 5. To be able to recognize and demonstrate social, ethical and professional responsibilities and the impact of technical and/or scientific solutions in global economic, environmental, and societal contexts.
- 6. To be able to function effectively independently and on teams for establishing goals, plan tasks, meet deadlines, and analyze risk and uncertainty.
- **21. Course Intended Learning Outcomes:** (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Identify basic physics relevant to nuclear medicine (radiation sources types and features....)

2. Identify, use and implement basic principles of radiation protection

3. Derive, use and implement statistical models and the treatment of exp. data formulae

- 4. Identify and distinguish between the various detector techniques
  - SO1: to be able to identify core concepts of medical physics and the physics principles in medical radiation therapy and different applications in medical physics.
  - 2. **SO2**: to be able to develop design, hypothesize, and conduct scientific research in medical physics.
  - 3. **SO3**: to be able to apply mathematical and analytical skills to solve problems, interpret diagnostic data, and test hypotheses in medical physics.
- 4. **SO4**: to be able to recognize and uphold ethical, social, and legal responsibilities in medical physics practice.
- 5. **SO5**: to be able to use computational tools to analyze data and demonstrate competency with medical diagnostic instruments.
- 6. **SO6**: to be able to function effectively independently and on teams for establishing goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

Course	The learning levels to be achieved							
ILOs	Remembering	Understanding	Applying	Analysing	evaluating	Creating		



1	√	√	~	✓	
2	√	√	~	✓	
3	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	

2<sup>γ</sup>. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs	ILO (1)	ILO (2)	ILO (3)	ILO (4)	ILO (5)
Course ILOs					
1	$\checkmark$				$\checkmark$
2	$\checkmark$				$\checkmark$
3	$\checkmark$				✓
4	$\checkmark$				$\checkmark$

### **2<sup>r</sup>.** Topic Outline and Schedule:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully	Platform Used	Synchronous / Asynchronous	<b>Evaluation Methods</b>	Learning Resources
1 2 2		BASIC PHYSICS FOR NUCLEAR MEDICINE	1, 5					
5	1.1-1.6							
	1.2							
	1.3							
4	2.1							
5	2.2							
6	2.3							



	1		1	r			
7			1,				
8			5				
9							
	3.1-3.3	RADIATION PROTECTION					
	3.2						
	3.3						
10	4.1						
11							
12							
		STATISTICS AND THE TREATMENT OF EXP.					
	4147	DATA					
	4.1-4./						
	12						
12	4.5		1				
13			1,				
		GENERAL CHARACTERISTICS OF DETECTORS	5				
	<i>c</i> 1						
	6.1-						
	6.4,						
	7.1-7.5						
1		•				•	

#### 2<sup>£</sup>. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform
First Exam	25		1-4	6	On campus
Second Exam	25		1-4	11	On campus
Final Exam	50		1-4	15	On campus

#### **2°.** Course Requirements:

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform...etc.):

NA



#### **27.** Course Policies:

A- Attendance policies:

- B- Absences from exams and submitting assignments on time:
- C- Health and safety procedures:
- D- Honesty policy regarding cheating, plagiarism, misbehavior:
- E- Grading policy:
- F- Available university services that support achievement in the course:

#### 2<sup>v</sup>. References:

A- Required book(s), assigned reading and audio-visuals:

Nuclear Medicine Physics, a Handbook for Teachers and Students, IAEA

B- Recommended books, materials, and media:

- 1- Leo, W.R., "Techniques for nuclear and particle physics experiments"
- 2- James E. Turner, "Atoms, Radiation, and Radiation Protection"
- 3- Glenn E Knoll, " Radiation Detection and Measurement "

#### 2<sup>^</sup>. Additional information:

Name of the Instructor or the Course Coordinator: Khalifeh AbuSaleem	Signature:	Date: 15/11/2024
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:



Name of the Head of Department	Signature:	Date:
Name of the Head of Quality Assurance Committee/ School or Center	Signature:	Date:
Name of the Dean or the Director	Signature:	Date: