هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	Radiation Physics
Course Code:	PHYS 486
Program:	B.Sc. in Physics
Department:	Department of Physics and astronomy
College:	College of Science
Institution:	King Saud University
Version:	2.0.0
Last Revision Date:	Sep 2023

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	2(2+0)				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☐	Elective☒			
3. Level/year at which this course is offered:	7 level / fourth year.				
4. Course general Description					
The course aims to introduce students to radiation quantities, Radiation doses and their units, interaction of radiation with matter, instruments for measuring personal doses, radiation monitoring and radioactive contamination, biological effects of radiation, external and internal radiation exposure, protection against different radiation sources and shielding, and radioactive wastes management. .					
5. Pre-requirements for this course (if any): Phys 481					
6. Co- requirements for this course (if any):					
7. Course Main Objective(s)					

- The student should grasp the basic information about:

  - radiation quantities, radiation doses and units - radiation dosimeters
  - biological effects of radiation
  - internal and external exposure to radiation

  - radiation interaction with matter

  - protection against radiation and radiation shielding,
  - protection from various sources of radiation, radioactive decontamination and radioactive waste management

- The student should identify the radiation protection rules.
- The student should be able to define the radioactive wastes and their proper handling.
- The student should be able to execute the basic radiation protection

regulations and radiation dose calculations.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	100	100%
2.	E-learning	0	0
3.	Hybrid • Traditional classroom • E-learning	0	0
4.	Distance learning	0	0

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	Total	30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Demonstrate a knowledge of fundamental aspects of the radiation physics, which include radioactivity, interaction of radiation with matter, radiation protection, types of radiation	K1	• Give extensive examples during lecture. • Give problem sheets to be discussed during lecture..	• Hold Class discussion, tutorial sessions. • Give quizzes, mid-term

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	detectors and dosimeters, and radioactive waste management.			exam and final exam.
1.2	Define terms and units of exposure, absorbed dose, and dose equivalent.	K2		
2.0	Skills			
2.1	Apply their knowledge and understanding to solve problems related to decay law, radiation doses, and inverse square law.	S1	• Give extensive examples during lecture • Give problem sheets to be discussed during lecture and labs. • assignments. • Discussions in the classes	• Hold Class discussion, tutorial and lab sessions. • Give quizzes, mid-term exam and final exam.
2.2		S2		
2.3		S3		
3.0	Values, autonomy, and responsibility			
3.1	Present oral and written scientific communication, think critically and work independently.	V1	•	Hold Class discussion

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to atom , nucleus and radiation	2
2.	Definition of radiation quantities, different between charged and uncharged radiation	4
3.	**Interaction of radiation with matter**	4
4.	Radiation doses and their units,	2
5.	Instruments for measuring personal doses, radiation monitoring and radioactive contamination,	6
6.	Biological effects of radiation,	2
7	External and internal radiation exposure	2
8.	Protection against different radiation sources and shielding,	4
9.	Radioactive wastes management.	4

10.		
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Midterm examination	Approx. 6	25%
2.	Second Midterm examination	Approx. 12	25%
3.	Homework	Every 5 weeks	10%
4.	Final examination	From 16 to 18	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Introduction to Health Physics: Fourth Edition
Supportive References	
Electronic Materials	None
Other Learning Materials	Internet sites relevant to the course

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom which accommodates 25 students.
Technology equipment (projector, smart board, software)	Whiteboard and Smart board
Other equipment (depending on the nature of the specialty)	Not applicable

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students\ Peer Reviewer	Indirect \ direct

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of students assessment	Students- Faculty	Direct
Quality of learning resources	students	Indirect
The extent to which CLOs have been achieved	Faculty	Indirect
Other	None	None

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Physics Department's council
REFERENCE NO.	7th (1st TERM/1445)
DATE	15/05/1445