



Course Specifications

Course Title	Medical Physics
Course Code	370213-3
Program	Bachelor's in Clinical Laboratory Sciences (Level-7)
Department	Clinical Laboratory Sciences
College	Applied Medical Sciences
Institution	Taif University



Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes.....	3
1. Course Description	3
2. Course Main Objective	4
3. Course Learning Outcomes	4
C. Course Content	4
D. Teaching and Assessment	5
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods.....	5
2. Assessment Tasks for Students	6
E. Student Academic Counseling and Support	6
F. Learning Resources and Facilities	6
1. Learning Resources	6
2. Facilities Required	7
G. Course Quality Evaluation	7
H. Specification Approval Data	8

A. Course Identification

1. Credit hours:
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 2 nd level/ 1 st year
4. Pre-requisites for this course (if any): No
5. Co-requisites for this course (if any): No

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours /week= 60 hours/semester	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Correspondence	None	0%
5	Other	None	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	None
4	Others (specify)	None
	Total	60
Other Learning Hours*		
1	Study	12
2	Assignments	4
3	Library	4
4	Projects/Research Essays/Theses	None
5	Others(specify)	None
	Total	20

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Medical Physics course is essential for all medical sciences programs as it is concerned with the basic knowledge of human body physics and mechanisms. Course deals with the application of physical phenomena on the healthy performance of the human body.

2. Course Main Objective

The main objective of this course is to provide the students with the principles of physics and its applications and effects on the function of different human body organs and systems and its clinical implication in medical specialties.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Identify the basic concepts of physics and their application to different body systems.	K1
1.2	Describe the mechanics of the human body in the framework of physics.	K1
1.3	Identify the different types of radiation and its application in medicine	K2
1.4	Describe the main concept of nuclear medicine and radiation protection	K2
2	Skills:	
None		
3	Competence:	
None		

C. Course Content

No	List of Topics (Theoretical)	Contact Hours
1	An introduction of force in and on the body	2
2	Levers systems, examples and problems on human body.	2
3	Friction Forces, Stress and strain and Young modulus.	2
5	Centrifuge Force and its medical applications (Sedimentation velocity)	2
6	Bernoulli's equation and its medical applications	2
7	How the blood and lungs interact	2
8	Physics of the breathing process	2
9	Inhalation and Exhalation processes	2
10	Airways resistance and Compliance and time constant	2
11	Lung Time constant, Physics of some common lung diseases	2
12	An introduction of radioactivity.	2
13	Types of natural radiation (alpha, beta, and gamma).	2
14	Half lifetime and decay constant.	2
15	Radiation protection, Clinical applications of different types of radiation	2

16	Structure of nerve cell, Action potential speed and propagation	2
17	Factors affecting the action potential propagation	2
Total		30
No	List of Topics (practical)	Contact Hours
1	Definition and differentiation of data, informations and knowledge	2
2	Types of data presentation and how to express data as figures	2
3	Measurements of Lung functions	2
4	Application on Spirometer and interpretation of the Spiro gram	2
5	Hook's law	2
6	Calculation of the relation between stress and strain	2
7	Gravity, friction and Buoyant forces	2
8	Calculation of the liquid viscosity	2
9	Inverse square law	2
10	Calculation of the relation between intensity and radiation exposure	2
11	Half value layer of the radiation source	2
12	Intensity of Radiation	2
13	X-ray shielding and absorption	2
14	Summary and Applications	2
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Identify the basic concepts of physics and their application to different body systems.	Lectures	Exam
1.2	Describe the mechanics of the human body in the framework of physics.	Lectures	Exam
1.3	Identify the different types of radiation and its application in medicine	Lectures Practical sessions	Exam Lab reports
1.4	Describe the main concept of nuclear medicine and radiation protection	Lectures Practical sessions	Exam Lab reports

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Theory Exam [Standardized Tests: MCQs]	7 th	20%
2	Final Practical Exam [OSCE/OSPE]	16 th	20%
3	Final Theory Exam [Standardized Tests: MCQs]	17 th	60%
TOTAL			100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Physics of the Body, John Cameron, James G. Skofronick and Roderick M. Grant, Medical Physics Publishing Corporation; 2 nd Edition, (1999). ISBN-13: 978-0944838914.
Essential References Materials	- Physics in Biology and Medicine, Paul Davidovits, Academic Press; 3 edition (2007) - Medical Physics and Biomedical Engineering, B.H. Brown Taylor & Francis; 1st edition (1999)
Electronic Materials	None
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms Science Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Smart Board,
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student's feedback on effectiveness of teaching and quality of courses.	Students	Indirect: Questionnaire Survey at the end of each semester.
Alignment map of course ILOs with that of program ILOs.	Development and accreditation committee	Direct: Student's Performance.
Availability of learning resources, facilities and equipments related to each course.	Students and faculty	Indirect: Questionnaire Survey at the end of each semester.
Evaluation of teaching	Peer evaluators	Direct: Peer evaluation
Standard of student achievement	Examination Committee	Direct: Students grades
Periodical review of course effectiveness and planning for its improvement.	Teaching staff/ Development and accreditation committee	Indirect: Review by Department Committee

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	Meeting No.10
Date	10-9-1440

