

T-104 2022

Course Specification

Course Title: Biophysics
Course Code: PHYS 460
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





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A. General information about the course:					
Οοι	Irse Identification	on			
1. (Credit hours:	3(3+0+0)			
2. C	ourse type				
a.	University 🗆	College 🗆	Department⊠	Track	Others□
b.	Required	Elective⊠			
3. Level/year at which this course is offered: Elective course					
4. Course general Description					
The course aims to introduce students to					
Biomechanics. Forces effects on our bodies. Vector analysis. Levers and equilibrium of rigid bodie					
s, Properties of fluids. Viscosity and surface tension. Bernoulli's equation and its applications. Effect					
tor	t of gravity and acceleration on the blood pressure. Nature of sound and sound intensity level. Ult				
city	city within the body. Equilibrium potential Eactors affecting the propagation of action potential				

Action potential measurements of some organs; ECG, EEG and ERG. Non-

ionizing Radiation. Physical and biological effects.

- 5. Pre-requirements for this course (if any): Phys 481
- 6. Co- requirements for this course (if any): NaN

7. Course Main Objective(s)

- 1. The students should grasp the basic physics knowledge needed for their life.
- 2. The students should able to handle the biological phenomenon and its changes with the physical parameters.
- 3. Adapt and organize the student's mentality.
- 4. Gaining a standard level of solving problems and evaluating numbers.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	100%
2.	E-learning	0	0
3.	HybridTraditional classroomE-learning	0	0
4.	Distance learning	0	0





No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	Total	45

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	g		
1.1	The student knows the foundations, basic concepts and terminology of general biophysics.	K1	 Give extensive examples during lecture. Give problem sheets to be discussed during lecture. 	 Hold Class discussion, tutorial sessions. Give quizzes, mid-term exam, and final exam.
2.0	Skills			
2.1	Knowledge of basic mathematical equations and methods to do basic calculations to solve problems related to the scientific subject.	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.
3.0	Values, autonomy, and respo	nsibility		
3.1	Develop critical and analytical thinking skills to solve biophysical problems	V 1	 Assignments. Homework 	Hold Class discussion
3.2	To show work independently and as part of a team.	V2	- Homework.	





C. Course Content

No	List of Topics	Contact Hours
1.	Biomechanics . Forces effects on our bodies. Vector analysis. Levers and equilibrium of rigid bodies	6
2.	Properties of fluids. Viscosity and surface tension	5
3.	Flow of liquids : Bernoulli's equation and its applications. Effect of gravity and accelerati on on the blood pressure	6
4.	Nature of sound and sound intensity level	5
5.	Ultrasound, production and its applications in diagnostic and treatment	5
6.	Nervous System and electricity within the body	5
7	Equilibrium potential, Factors affecting the propagation of action potenti al. Action potential measurements of some organs; ECG, EEG and ERG.	6
8.	Non-ionizing Radiation Physical and biological effects.	4
9.	Stress - Strain curve. Young's and Shear modulus for materials and biological tissues	3
	Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Midterm examination	Approx. 6	20%
2.	Second Midterm examination	Approx. 12	20%
3.	Assignments	Weekly	20%
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	مقدمة في الفيزياء الحيوية وتطبيقاتها الطبية , السيد محمود سليمان ومحمد العائد 2003م
Supportive References	Physics in Biology and Medicine, Paul Davidovits, Academic Press (2012) الفيزياء في علم الأحياء و الطب، تأليف: بول دافيدوفيتس ترجمة:ليلى بابصيل و سوسن صواف ،دار جامعة الملك سعود، ١٤٤ه
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
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.	8 th (1 st term/1445)
DATE	06/06/1445

