



# Course Specification

(Bachelor)

Course Title: **Physics for Health Specialties**

Course Code: **105 PHYS-4**

Program: **All Health Programs at Jazan University**

Department: **Physical Sciences**

College: **College of Science**

Institution: **Jazan University (JU)**

Version: **2023**

Last Revision Date: **26/4/ 2024**

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## A. General information about the course:

### 1. Course Identification

1. Credit hours: 4 h (3L+1P)

#### 2. Course type

A. ☐ University ☒ College ☐ Department ☐ Track ☐ Others  
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2 / First Year)

#### 4. Course general Description:

5. Pre-requirements for this course (if any):

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6. Co-requisites for this course (if any): None

#### 7. Course Main Objective(s):

The main objective of this course is to provide the students with basic knowledge and practical skills in general physics as well as some related applications in the medical fields.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	60%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4	Distance learning		
5	Other (Lab)	30	40%



### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		75

### 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: (Upon completion of the course, student will be able to)			
1.1	<b>Recall:</b> Basics knowledge of general laws of motion, heat, thermodynamics, fluid, metabolism, Electricity and magnetism and radiation units.	PLO 1.1	Lecture, discussion in class and labs	<b>Direct:</b> Quiz and mid-term & final Exams. <b>Indirect:</b> student survey
1.2	<b>Define</b> Basic physical quantities related to kinematics, Newton's laws, thermodynamics, fluid properties, basic electricity, geometrical optics, nuclear and ionizing radiation as well as their related medical aspects.	PLO 1.2	Lecture, discussion in class and labs	<b>Direct:</b> Quiz and mid-term & final Exams. <b>Indirect:</b> student survey
...				
2.0	Skills: (Upon completion of the course, student will be able to)			
2.1	<b>Solve</b> the problems of general laws of motion, heat, thermodynamics, fluid, metabolism, Electricity and magnetism and radiation.	PLO 2.1	Lecture, discussion in class and labs	<b>Direct:</b> Quiz and mid-term & final Exams. <b>Indirect:</b> student survey
2.2	<b>Perform</b> laboratory experiments about convex lens, critical angle, velocity of sound, viscosity, surface tension. ohm's law, Archimedes principle and determination of capacitance by discharging	PLO 2.2	Hands on lab demonstrations-guided discussion – guided discovery	Lab report, final exam sheets and assessment.



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	capacitor method.			
...				
3.0	Values, autonomy, and responsibility; (Upon completion of the course, student will be able to)			
3.1	<b>Demonstrate</b> abilities to work in groups and bear individual responsibility during lab work, interactive discussion, and group assignments	PLO 3.1	Interactive and Group discussion, expository and discovery teaching	<b>Direct</b> (formative and summative): In-lab interactive questioning <b>Indirect:</b> student survey
3.2				
...				

## C. Course Content

### Theoretical Part:

No	List of Topics	Contact Hours
1.	<b>General Laws of Motion:</b> Measurements, and Units, Density, Newton's laws, Gravitational Force, Weight, Friction, Torques, Equilibrium of Rigid Body, Center of Gravity, Levers, and Mechanical Advantage.	9
2.	<b>Heat:</b> Temperature Scales, Mechanical Work, The First Law of Thermodynamics, Human Metabolism, Heat Capacity, Phase Change, and Heat Transfer (Conduction, Convection and Radiation).	6
3	<b>Fluids:</b> Archimedes' Principle, Equation of Continuity and Streamline Flow, Bernoulli's Equation, The Role of Gravity in the Circulation, Blood Pressure Measurements, Viscosity, Viscous Drag Forces, Centrifugation, Surface Tension, Laplace's Law, and Surfactant in the Lungs.	9
4	<b>Electricity and Magnetism:</b> Electric Current, Resistance, Series and Parallel Resistors, Circuit Containing Resistance and Capacitance (Pace Maker), Resistance and Capacitance of an Axon, Magnetic Fields, Magnetic Force on a Moving Charge, and Magnetic Resonance Imaging (MRI).	6
5	<b>Sound:</b> The Nature and Speed of Sound, The Intensity of Sound Waves, Auditory Response, and Ultrasound	3
6	<b>Light:</b> The Index of Refraction, Reflection of Light, Refraction of Light, Total Internal Reflection, Mirrors and Lenses, Power of Lens, Human Eye, and Optical Defects of the Eye.	6
5	<b>Radiations:</b> X-rays, Nuclear Structure, Radioactivity, Half-Life, Radioactive Decays, Radiation Units, Harmful Effects of Radiation, Radiation in Medicine, Radiation Detection and Measurements.	6
Total		45





## Experimental Part

No	List of Topics	Contact Hours
1.	Accurate measurements	2
2.	Determination of acceleration due to gravity	2
3.	Verification of Archimedes' principle	2
4.	Determination of velocity of a fluid by Stokes method	2
5.	Determination of the surface tension coefficient of a liquid	2
6.	Verification of Ohm's law and law of connection of resistors	2
7.	Determination of capacitance by discharging capacitor method	2
8.	Determination of critical angle and refractive index of acrylic substance	2
9.	Power of convex lens	2
10.	Power of concave mirror	2
11.	Velocity of sound in air	2
12.	Determination of a specific heat capacity of a material	2
13.	Introduction, review, and various exams	6
<b>Total</b>		<b>30</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, student Activities and quizzes	1-10	10%
2.	Mid-term exam	6	20%
3.	Lab report	Weekly	10%
4	Final practical exam	15	10%
5	Final Exam	16	50%

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

## E. Learning Resources and Facilities

### 1. References and Learning Resources

<b>Essential References</b>	<ul style="list-style-type: none"> <li>Physics in Biology and Medicine, Paul D, Elsevier NC, 3rd Edition, 2008.</li> <li>Medical Physics, by John R. Cameron and James G. Skofronick. A Wiley-Interscience Publication, John Wiley and Sons, New York 1978.</li> <li>College Physics, by Raymond A. Serway, Chris Vuille and Jerry S. Faughn, eighth edition, 2009</li> </ul>
<b>Supportive References</b>	<b>None</b>
<b>Electronic Materials</b>	Physics, 3rd Edition, by Joseph W. Kane and Morton M. Sternheim, John Wiley and Sons, New York, 1988.
<b>Other Learning Materials</b>	<b>None</b>



## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
<b>Technology equipment</b> (projector, smart board, software)	Smart board and projector
<b>Other equipment</b> (depending on the nature of the specialty)	None

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Peer, and program leader	Indirect (CES) - Indirect peer evaluation
Effectiveness of Students assessment	Students, Program Assessment Committee	Direct/ Indirect
Quality of learning resources	Students, Faculty members	Indirect
The extent to which CLOs have been achieved	Instructor	Direct/ Indirect
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	DEPARTMENT BOARD
<b>REFERENCE NO.</b>	7
<b>DATE</b>	6/5/2024

Approved by  
Head of Physical Sciences Department  
Dr. Hussain Alathlawi

