المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

Course Title:	Physics
Course Code:	**1101102**
Program:	**B. Sc.**
Department:	**Physics**
College:	**Science**
Institution:	**Northern Border University**

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 1
4. Pre-requisites for this course (if any)**:**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	45	100%
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	45
2 3	**Laboratory/Studio** **Tutorial**	
4	**Others** (specify)	
	Total	45
Other Learning Hours*		
1	**Study**	45
2	**Assignments**	5
3	**Library**	5
4	**Projects/Research Essays/Theses**	8
5	**Others** (presentation)	5
	Total	68

* 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

Study of units and dimensions, vectors and their properties. Gravitational force, Newton's laws. Torque and condition of equilibrium, Class of levers and examples of levers in human body. Properties of mechanical waves (Sound), Intensity and loudness, sound frequencies classification, Doppler effect, Human Ear, Ultrasound Applications. Light wave, Optical Instruments, Eye and correcting vision problems Eye. Interaction of radiation with matter, RBE and LET, Isotopes, Types of decay, Laws and Definitions in Radioactivity. Bioelectricity, Central Nervous System, Neurons, Measurements of Membrane potential, The Action Potential, Sodium-Potassium Pump, Measurement of action potential activity.

2. Course Main Objective

By the end of this course the student will be able to:

1- Utilize units and quantities in the international system SI
2- Deal with vectors and their properties: addition and multiplication of vectors
3- know how to apply the fundamental concepts and Physics laws in human body.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	To describe the physical quantities and their units & dimensions.	K1
1.2	To recognize the physics laws and their application on living things.	K3
1.3	Know the physics controlling living system.	K3
2	**Skills:**	
2.1	Use physics to explain processes in living organism	S4
2.2	Compare between different tools used for diagnosis or analysis	S4
3	**Competence:**	
3.1	Express and analyze natural phenomena in living system	C4
3.2	Explain how organisms' sense and control their internal environment and how they respond to external change	C4

C. Course Content

No	List of Topics	Contact Hours
1	Units and Dimensions: System of Units, Consistency of Units, Units Conversion, Dimensional analysis.	6
2	Vectors Properties, Adding and Subtracting Vectors Graphically, Properties of Vector Components, Addition &Subtraction of Vectors by means of Components	3
3	Forces, Torques and Equilibrium, Gravitational force, Newton's first law, Newton's third law, Class of levers: class 1, class 2 and class 3 and actual mechanical advantage. Jumping from crouching: kinetic energy and potential energy, viscoelastic properties of bones	6

4	Properties of sound wave, Intensity and loudness, sound frequencies classification, Reflection and refraction of sound waves, Interference, Standing waves, Diffraction of sound waves. Doppler effect, Human Ear, Ultrasound Applications	9
5	Light, Vision and Eye, images formed by mirrors: plane mirrors, curved mirrors: Concave (converging), Convex (diverging). Images formed by lenses, the human eye, eye defects: short-sightedness, long-sightedness, astigmatism. Correcting vision problems	9
6	Interaction of radiation with matter, Radiation Damage, RBE and LET, Isotopes, Types of decay, Laws and Definitions in Radioactivity	6
7	Bioelectricity, Central Nervous System, Autonomic Nervous System, Neurons, Measurements of Membrane potential, The Action Potential, Sodium-Potassium Pump, Electrical devices to measure action potential: ECG, EEG, ERG, EOG	6
Total		45

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	To describe the physical quantities and their units & dimensions.	Lecture/Discussions/Brainstorming	Discussions/quizzes
1.2	To recognize the physics laws and their application on living things.	Lecture	Discussions/Quizzes/ Presentations
1.3	Know the physics controlling living system.	Lecture/ Internet /Library	Discussions/Presentations
2.0	**Skills**		
2.1	Use physics to explain processes in living organism	Lecturer and discussions	Discussions/Quizzes
2.2	Compare between different tools used for diagnosis or analysis	Lecturer and discussions	Discussions
3.0	**Competence**		
3.1	Express and analyze natural	Lecturer and discussions	Quizzes/Discussions

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	phenomena in living system		
3.2	Explain how organisms' sense and control their internal environment and how they respond to external change	Class participation	Presentations/Quizzes

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	3	5
2	Quiz 2	5	5
3	Mid-term 1	6-7	20
4	Mid-term 2	10-11	20
5	Presentation/ Oral discussions/Activities	8-9	10
6	Final Exam	15	40
7			
8			

***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. (include amount of time teaching staff are expected to be available each week)
- During the study days and Academic office hours

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Biomechanics of the Human Body, Emico Okuno and Luciano Fratin (2014) springer.
Essential References Materials	1- Physical Biology of the Cell, R. Philips et al, Garland Science, 2008. 2- Applied Biophysics: A Molecular Approach for Physical Scientists, T. A. Waigh, Wiley, 2007. 3- Biophysics: An introduction, R Cotterill, Wiley, 2002.
Electronic Materials	
Other Learning Materials	Youtube videos and internet

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
- List the most important criticisms and strengths	students	direct
- Inadequate references books availability	students	direct
- Difficulty with English language	students	direct
- Students find course contents important	students	indirect
- Students have learned a lot from Staff.	Program Leaders	indirect

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	
Reference No.	
Date	