Specification for Biophysics course

2025/2026

1-Basic information

1.	Course title	Biophysics							
2.	Course code	BIP.121							
3.	Department/s participating in delivery of the course	Physics							
3.	Academic level at which the course is taught	1st year							
4.	Semester	Spring Semester							
5.	Number of units/credit hours	Theoretical	1	Practical	1(2)	Other	0	Total	2(3)
6.	Course Type	√ Obligatory Elective							
7.	Academic program	Bachelor of Veterinary Medicine (BVM)							
8.	University	Benha University							
9.	Faculty	Veterinary medicine							
10.	Name of course coordinator	Dr. MOSTAFA ISMAIL. Faculty of science, Benha university							
11.	Course Specification Approval Date	Faculty council 27-8-2025							
12.	Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	Department council on 8/7/2025							

2-Course overview

- Course contents written in the program bylaw:
- Body electricity and tissue /organ electric conductivity, Biophysical basics of diagnostic X- ray; natural and artificial nuclear activity; control of ionized radiation and personal preventive means; cooling and heating measures in medical and surgical treatment.

3- Course Learning Outcomes CLOs

	(NARS)		Course ILOS	
	Code	Text	Code	text
Knowledge and understanding	2.1	Basic sciences of biology, chemistry, biophysics, genetics, biostatics, computer science and veterinary terminology.	a1	Define the fundamental component for biophysical system.
			a2	Describe the composition and structure of living cell and cell membrane
			a3	Describe the relation between the activity of Nerve cell and cell voltage
			a4	Estimate the basic of temperature and pressure.
Intellectual skills	4.2	Assess and criticize, at the fundamental level, how data are derived.	b1	Analyze the cell structure, and Biopolymer.
			b2	Diagram the electrical circuit used to measure the biological problems.
			b3	Compare between the physical properties for DNA and cell.
Professional and practical skills	3.1	Employ all the gained knowledge and understanding in clinical practice in a skillful pattern.	c1	Use the structural investigation techniques
			c2	Acquire the out pouts data from measuring techniques.
			c3	Acquire the out pout data from measuring

				techniques.
General and transferable skills	5.1	Work under pressure and / or contradictory conditions.	d1	Work under pressure during biophysics lab cession
	5.6	Utilize computer and internet skills.	d2	Utilize computer and internet skills, read paper via internet in biophysics

3- Course Learning Outcomes CLOs

4- Teaching and learning methods					
Lectures	√	Discussion & seminar	√	Practical	√
Presentation & movies	√	Problem solving	√	Brain storming	√
Others					

- Course Schedule:

Week [W]	Topics	Expected number of the Learning Hours				Total
		Theoretical	Laboratory [practical]	Others	Self-learning (Tasks / Assignments/ Projects/ ...)	
W1	Study DNA	1	-	0		2(3)
W2	Bio Polymers	1	-	0		2(3)

W3	Cell membrane1	1	-	0	Formative quiz	2(3)
W4	Cell membrane2	1	-	0		2(3)
W5	membrane Potential	1	-	0		2(3)
W6	County of membrane Potential	1	2(4)	0	Formative quiz	3(5)
W7	Semester work (one hour exam)	----------				
W8	Circuits and models of measurements	1	2(4)	0		3(5)
W9	Electrical activity for nerve cell	2	2(4)	0	Formative quiz	3(5)
W10	Methods of measuring temperature1	1	1(2)	0		2(3)
W11	Methods of measuring temperature2	1	1(2)	0		2(3)
W12	Methods of measuring pressure1	1	2(4)	0	Formative quiz	3(5)
W13	Methods of measuring pressure2	1	2(4)	0		3(5)
W14	Cell voltage measurements	1	1(2)	0		2(3)
W15	Practical exam	- ----------				

5- Assessment timing and grading:

a- Assessment methods (summative and formative)

1. Formative assessment: including (weekly quizzes, homework assignments and surveys).
2. Summative assessment including (quizzes, class activities, semester work, practical exam, oral exams and final written exams).

b- Assessment schedule and weight

Assessment method	Timing	Grade	Percent
Semester work including one hour exam	7th week	10	10%
Formative assessment	Through semester	-------	---------
Practical exam	15th week	30	30%
oral exam	End of semester	10	10%
Written exam	End of semester	50	50%
Assignments / Project /Portfolio/ Logbook	--------	-------	-------
Field training	--------	----------	-------
Other (Mention)	-------	--------	-------
Total		100	100%

6- Learning resources and supportive facilities:

Learning resources	Main reference	Student handbook: Lecture note approved by Physics department
	Essential books (text books)	• El-Sayed E.S. "Biophysics Concepts and Medical Applications", Ain shams Un. Press. 2007. • Aidley D.J. & Stanfield P.R. " Ion Channels", Cambridge Un. Press. 1996. • " Electroretinography", U.S. National Library of Medicine, 11 april 2005. • Bagni, M. A., G. Cecchi, F. Colomo, and P. Garzella. 1992. Journal of Muscle Research and Cell Motility 13:516-522. • Sybesma C. "An Introduction to Biophysics" Academic press,1977. • Radiation Biophysics, Edward L.Alpen (1998). • A primer in Applied Radiation Physics, FA Smith (2000).

		• Physics and engineering of radiation detection, Sayed naeem Ahmed (2007).
	Periodicals, Web sites, . . . etc	• http://cms.nelc.edu.eg. • www.EKB.eg
	Learning platform	Thinqi
supportive facilities	Devices & instruments	1- Data show. 2- Laboratory. 3- White board.

Matrices:

A- Content and ILOs matrix:

Topic	A) Knowledge and understanding	B) Intellectual skills	C) Professional and practical skills	D) General and transferable skills
Study DNA	a1,a2	b1,b3	c1,c2	d1,d2
Bio Polymers	a1,a2	b1,b3	c1,c2	d1,d2
Cell membrane	a1,a2	b2	c1, c3	d1,d2
membrane Potential	a1,a2,a3		c1,c2,c3	d1,d2
Countuity of membrane Potential	a3	b2	c1,c2	d1,d2
Circuits and models of measurements	a3	b2	c2,c3	d1,d2
Electrical activity for nerve cell	a3	b2	c3	d1,d2
Methods of measuring temperature	a4	b2	c2,c3	d1,d2
Methods of	a4	b2	c1,c2,c3	d1,d2

measuring pressure				
Cell voltage measurements	a3	b2	c3	d1,d2

B- Teaching, learning methods:

ILOs		Teaching and Learning methods					
		L	P&M	D&S	T	Ps	Bs
Knowledge and understanding	a1	√	√	√	√	√	
	a2	√	√	√	√	√	√
	a3	√		√	√	√	√
	a4	√	√	√	√	√	
Intellectual skills	b1	√	√		√	√	
	b2	√	√		√	√	√
	b3	√	√		√	√	
Professional and practical skills	c1		√		√	√	
	c2				√	√	
	c3				√	√	
General Skills	d1		√	√	√	√	√
	d2		√	√	√	√	

L: Lecture, P&M: Presentations & Movies, D&S: Discussions & Seminars PT: Practical training, Ps: Problem solving, Bs: Brain storming

C- Assessment methods and ILOs matrix::

ILOs		Assessment method				
		Formative assessment	Semester work (1 hr exam)	Practical	Oral	Written
Knowledge and understanding	a1			√	√	√
	a2			√	√	√
	a3	√		√	√	√
	a4	√	√	√	√	√
Intellectual skills	b1		√		√	√
	b2				√	√
	b3	√	√	√	√	√
Professional and practical	c1		√	√		
	c2			√		

	c3		√	√		
Skill ral	d1				√	
	d2				√	

-Course coordinator:
Dr. MOSTAFA ISMAIL.
Faculty of science, Benha University

-Program coordinator: Prof. Dr. Mahmoud Abouelroos