

2023-2024

PHYSICS AND BIOPHYSICS

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
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Division: Basic and Pre-clinical Science Division
Department of Physics and Biophysics
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Register no.:
File no.: 61-03-23/28-b
Zagreb, 08/09/2023



170526	REPUBLIKA HRVATSKA	
Veterinarski fakultet u Zagrebu		
Primljeno:	11.09.2023	
Klasifikacijske oznaka	Org. jed.	
605-03/23-04/28	251-61-32;	
Uredžbeni broj	Prilozi	Vrijednost
251-61-03-23-20	0	-

COURSE SYLLABUS

Course name: PHYSICS AND BIOPHYSICS

Academic year 2023-24

Course leader:

Teachers: Dr. Selim Pašić, associate professor

Associate teachers: Nato Popara, mag. Phys.

First day of classes: 29/09/2023

Last day of classes: 18/01/2024

Activities - Physics and biophysics (1/5)

Start Dat	Start Tim	End Time	Subject	Group	Instructor	Room	Length
29/09/2023	8:15	9:45	p01 Physics in medicine and measurement units	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
02/10/2023	12:15	13:45	p02 Mechanics	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
04/10/2023	12:15	13:45	p03 Fluid mechanics	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
09/10/2023	12:15	13:45	p04 Heat	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
12/10/2023	10:15	11:45	p05 Vibration, waves and acoustics	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
16/10/2023	12:15	13:45	p06 Optics	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
19/10/2023	12:15	13:45	p07 Electricity and magnetism	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
25/10/2023	12:15	13:45	p08 Structure of matter	1E-1, 1E-2, 1E-3	Pašic S.	P_fizika	1:30
27/10/2023	10:15	11:45	v01 Measurement and data processing	1E-1, 1E-2	Pašic S.	V_fizika	1:30
27/10/2023	13:00	14:30	v01 Measurement and data processing	1E-3	Pašic S.	V_fizika	1:30
30/10/2023	14:15	15:45	v02 Data processing and measurement units	1E-3	Pašic S.	V_fizika	1:30

Activities - Physics and biophysics (2/5)

Start Dat	Start Tim	End Time	Subject	Group	Instructor	Room	Length
06/11/2023	14:15	15:45	v02 Data processing and measurement units	1E-1, 1E-2	Pašic S.	V_fizika	1:30
08/11/2023	10:15	11:45	v03 Hydrodynamics	1E-1, 1E-2	Pašic S.	V_fizika	1:30
08/11/2023	12:15	13:45	v03 Hydrodynamics	1E-3	Pašic S.	V_fizika	1:30
13/11/2023	14:15	15:45	v04 Mechanics, waves and UV diagnostics, thermodynamics	1E-1, 1E-2	Pašic S.	V_fizika	1:30
14/11/2023	12:15	13:45	v04 Mechanics, waves and UV diagnostics, thermodynamics	1E-3	Pašic S.	V_fizika	1:30
16/11/2023	10:15	11:45	v05 Optics, radioactive decay	1E-3	Pašic S.	V_fizika	1:30
16/11/2023	12:15	13:45	v05 Optics, radioactive decay	1E-1, 1E-2	Pašic S.	V_fizika	1:30
20/11/2023	14:15	15:45	v06 Radioactive decay, electricity and magnetism	1E-3	Pašic S.	V_fizika	1:30

Activities - Physics and biophysics (3/5)

Start Dat	Start Tim	End Time	Subject	Group	Instructor	Room	Length
21/11/2023	10:10	11:40	v06 Radioactive decay, electricity and magnetism	1E-1, 1E-2	Pašic S.	V_fizika	1:30
23/11/2023	12:15	13:45	v07 Data processing colloquium	1E-3	Pašic S.	V_fizika	1:30
23/11/2023	14:15	15:45	v07 Data processing colloquium	1E-1, 1E-2	Pašic S.	V_fizika	1:30
24/11/2023	14:15	15:45	v08 Laboratory exercises 1	1E-1, 1E-2	Pašic S.	V_fizika	1:30
27/11/2023	14:15	15:45	v08 Laboratory exercises 1	1E-3	Pašic S.	V_fizika	1:30
28/11/2023	14:15	15:45	v09 Laboratory exercises 2	1E-1, 1E-2	Pašic S.	V_fizika	1:30
29/11/2023	10:15	11:45	v09 Laboratory exercises 2	1E-3	Pašic S.	V_fizika	1:30
04/12/2023	12:15	13:45	v10 Laboratory exercises 3	1E-3	Pašic S.	V_fizika	1:30
04/12/2023	14:15	15:45	v10 Laboratory exercises 3	1E-1, 1E-2	Pašic S.	V_fizika	1:30
06/12/2023	14:15	15:45	v11 Laboratory exercises 4	1E-1, 1E-2	Pašic S.	V_fizika	1:30

Activities - Physics and biophysics (4/5)

Start Dat	Start Tim	End Time	Subject	Group	Instructor	Room	Length
07/12/2023	10:15	11:45	v11 Laboratory exercises 4	1E-3	Pašic S.	V_fizika	1:30
11/12/2023	10:15	11:45	v12 Laboratory exercises 5	1E-1, 1E-2	Pašic S.	V_fizika	1:30
11/12/2023	12:15	13:45	v12 Laboratory exercises 5	1E-3	Pašic S.	V_fizika	1:30
13/12/2023	12:15	13:45	v13 Laboratory exercises 6	1E-1, 1E-2	Pašic S.	V_fizika	1:30
13/12/2023	14:15	15:45	v13 Laboratory exercises 6	1E-3	Pašic S.	V_fizika	1:30
15/12/2023	10:15	11:45	v14 Laboratory exercises 7	1E-3	Pašic S.	V_fizika	1:30
15/12/2023	14:15	15:45	v14 Laboratory exercises 7	1E-1, 1E-2	Pašic S.	V_fizika	1:30
18/12/2023	12:15	13:45	v15 Laboratory exercises 8	1E-1, 1E-2	Pašic S.	V_fizika	1:30
20/12/2023	13:15	14:45	v15 Laboratory exercises 8	1E-3	Pašic S.	V_fizika	1:30
08/01/2024	10:15	11:45	v16 Laboratory exercises 9	1E-1, 1E-2	Pašic S.	V_fizika	1:30

Activities - Physics and biophysics (5/5)

Start Dat	Start Tim	End Time	Subject	Group	Instructor	Room	Length
08/01/2024	14:15	15:45	v16 Laboratory exercises 9	1E-3	Pašic S.	V_fizika	1:30
10/01/2024	10:15	11:45	v17 Laboratory exercises 10	1E-3	Pašic S.	V_fizika	1:30
11/01/2024	10:15	11:45	v17 Laboratory exercises 10	1E-1, 1E-2	Pašic S.	V_fizika	1:30
15/01/2024	13:00	14:30	v18 Laboratory exercises 11	1E-1, 1E-2	Pašic S.	V_fizika	1:30
16/01/2024	10:15	11:45	v18 Laboratory exercises 11	1E-3	Pašic S.	V_fizika	1:30
18/01/2024	10:15	11:45	v19 Laboratory exercises 12	1E-1, 1E-2	Pašic S.	V_fizika	1:30
18/01/2024	12:15	13:45	v19 Laboratory exercises 12	1E-3	Pašic S.	V_fizika	1:30
Total: 46							69:00

STUDENT OBLIGATIONS

Lecture attendance	A student gains 0.375 point for attending 1 lecture lesson. During the course a student must attend 8 lectures in order to gain minimal 3 points (8 lessons x 0.375 units \approx 3 points). A student can gain 6 points max. (16 lessons x 0.375 = 6 points) from this evaluation element.
Practicals attendance	A student gains 0.316 point for attending one exercise. During the course a student must attend 26 exercises in order to gain minimal 8 points (26 lessons x 0.316 units = 8 points). A student can gain maximal 12 points (38 lessons x 0.316 units = 12 points) from this element of evaluation.
Active participation in seminars and practicals	During the course a student must complete 12 lab tasks. The student must be prepared for each problem according to methodical units. During the exercise a student must solve the discussed problems and analyse the measured data. If a student completes all activities process correctly, it can gain maximally 0.8333 points per exercise. The maximal number of point from all exercises is 10 (12 exercises x 0.8333 points). The minimal number of points is 5.
Final exam	A student must gain the minimal number of points from all five evaluation elements to have right to take the final exam. The final exam is in written form and it consists of 20 tasks, between them are about 40% calculation exercises. Each correctly solved task in the test carries out 2 points. A student should solve at least 12 tasks to obtain the minimal number of points (24). The maximum number of points, a student can gain at the final exam, is 40.
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine. Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. Article 41: a student can justifiably be absent from up to 50 % of the lectures; 30% of the seminars and 30 % of the exercises.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	During the course, the following preliminary exams will be organized: <ul style="list-style-type: none"> a. measuring units preliminary exam (12 tasks x 0.5 points = 6 points). Minimal number of points is 4 (8 tasks x 0.5 = 4 points). b. An exam of processing of the data and 12 entry preliminary exams for each lab exercise. Each exercise consists of 5 questions. Each correct answer on the question carries 0.4 points. The maximal number of points per one entry exam is 2 points (5 questions x 0.4 points = 2 points). The maximal number of points is 26 ((12 lab exercises + an exam of processing x 2 points/lab exercise = 26 points). The minimal number of points is 16.
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	The maximum number of points from this evaluation element is 32. Minimal number of points is 20. Student which doesn't achieve minimum points from this evaluation element has right on tree repeated preliminary exams, which will be hold during the semester. The repeated preliminary exam contains of two parts: measuring units correction preliminary exam and correction entry preliminary exam of the all 12 exercises. The student must gain minimal 4 points to achieve a minimum measurement units preliminary exam score and 16 points from exercises preliminary exam in order to achieve right to take the final exam. The right to take the repeated preliminary exam does not have the student who didn't gain the minimal point from the two evaluations elements: attending lectures and attending exercises.
Final exams (dates)	24.11. 2024., 07.02.2024., 20.02.2024.
Form of final exam	Written test

LITERATURE

Obligatory literature	<ol style="list-style-type: none"> 1. S. Pašić: Laboratory exercises manual for students of veterinary medicine (http://www.fizika.vef.unizg.hr, PDF book) 2. C. Hilyard, H.C. Biggin: Fizika za biologe, Školska knjiga, Zagreb, 1984. or 1989. 3. D. M. Burns, S. G. G. Macdonald: Fizika za biologe i medicinare, Školska knjiga, Zagreb, 1980. 4. D. Winterhalter, A. Sliepčević, A. Kuntarić, K. Kempni: Vježbe iz fizike, Školska knjiga, Zagreb, bilo koje izdanje iza 1981.
Optional literature	<ol style="list-style-type: none"> 1. J. N. Herak: Osnove kemijske fizike; Zagreb, Farmaceutsko-biokemijski fakultet, 2001. (Udžbenici Sveučilišta u Zagrebu = Manualia Universitatis studiorum Zagrabiensis) 2. J. Brnjas Kraljević: Fizika za studente medicine, I dio, 2001., Zagreb, (Udžbenici Sveučilišta u Zagrebu = Manualia Universitatis studiorum Zagrabiensis)

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	Understanding physical laws on which the principles of diagnostic methods are based. Understanding complex diagnostic methods on the level of fundamental natural laws. Understanding the advantages and disadvantages of individual diagnostic methods. Applying the knowledge the student has gained in order to choose diagnostic methods on the basis of their essential differences and resolution. Applying the knowledge the student has gained in carrying out diagnostic procedures.
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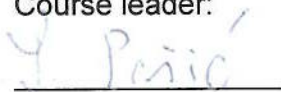
Learning outcomes

Having successfully completed the course, the students will be able to: describe diagnostic devices in accordance with their purpose and construction; understand the essence and differences of basic diagnostic methods in accordance with their physical basis; describe the advantages and disadvantages of individual diagnostic methods; compare methods of image diagnostics on the basis of their resolution and contrast.

GRADING SCHEME

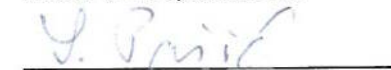
<i>Points</i>	<i>Grade</i>
Up to 59	1 (F)
60-68	2 (E)
69-76	2 (D)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

Course leader:



Dr. Selim Pašić, associate professor

Head of Department:



dr. Selim Pašić, associate professor

Note: The course leader is required to submit a Course Syllabus to all teachers and associates pertaining to the Course.