

ACADEMIC YEAR 2023/2024

General information	
Academic subject	APPLIED PHYSICS (integrated exam of MATHEMATIC AND PHYSICS)
Degree course	Animal Science L38
Academic Year	I year
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic calendar (starting and ending date)	II Semester: 26/04/2024 - 14/06/2024
Attendance	Mandatory

Professor/ Lecturer	
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Telephone	
Department and address	Campus of Veterinary Medicine, S.P. 62 to Casamassima km 3, 70010 Valenzano (BA)
Virtual headquarters	Microsoft Teams platform if necessary
Tutoring (time and day)	By appointment to be agreed via email.

Syllabus	
Learning Objectives	Students should know and be able to understand classical physics topics such as those related to material point mechanics, mechanics of material point systems and rigid body, fluid mechanics, thermology, thermodynamics, electromagnetism, electromagnetic waves, and modern physics topics.
Course prerequisites	Basic knowledge of mathematics.
Contents	<p>Units and Physical Quantities: System of Units, Physical Quantities: Scalars and Vectors, Vector Algebra. Material Point Mechanics: Kinematics - Rectilinear Motion: Uniform Rectilinear Motion, Uniformly Accelerated Rectilinear Motion, Harmonic Motion, Circular Motion: Uniform Circular Motion Uniformly Accelerated Circular Motion.</p> <p>Dynamics - First Principle of Dynamics , Second Principle of Dynamics, Third Principle of Dynamics, Momentum and Principle of Conservation of Momentum, Momentum of Momentum and Principle of Conservation of Momentum of Momentum, Types of Forces: Weight Force, Elastic Force, Vascular Reactions, Passive Resistances, Centripetal Forces, Motion on an Inclined Plane, Work in Uniform Force Fields, Work in Central Force Fields, Potential Energy, Kinetic Energy, Principle of Conservation of Mechanical Energy, Principle of Conservation of Energy.</p> <p>Material Point Systems and Levers.</p> <p>Fluid Mechanics: General properties of liquids, General properties of aeriforms, Pressure exerted on a fluid - Pascal's Law, Pressure exerted by a fluid - Stevino's Law. Atmospheric pressure, Measurement of pressures: open-tube and closed-tube pressure gauges, Blood pressure, Archimedes principle, Fluid dynamics, Types of motion, Flow rate of a current, Continuity equation, Theorem of work and</p>

	<p>kinetic energy for ideal fluids - Bernoulli equation and its applications, Viscosity, Poiseuille equation, Blood flow in the human body.</p> <p>Thermology: temperature, thermometric scales, temperature meters.</p> <p>Thermodynamics: Thermodynamic System, Thermodynamic Equilibrium, Variables of State and Equation of State, Transformations, Work, Heat, Heat Transmission, First Principle of Thermodynamics, Perfect Gases, Equation of State of Perfect Gases, Transformations of Perfect Gases, Perfect Gas Model, Kinetic Theory, Real Gas.</p> <p>Electromagnetism and Electromagnetic Waves.</p>
Books and bibliography	<ul style="list-style-type: none"> • Fisica Principi e Applicazioni, Casa Editrice Ambrosiana, Giancoli. • Fondamenti di Fisica, Serway Jewett, Bellotti – Cataudella.
Additional materials	Powerpoint slides.

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	48		102
ECTS			
6	6		
Teaching strategy		Explanation of the topics by means of slide projections, solving exercises on the blackboard and related discussion during the lectures. E-learning methods will only be used in the event of a medical emergency.	

Expected learning outcomes	
Knowledge and understanding on:	<ul style="list-style-type: none"> ○ Knowledge of basic principles related to classical physics topics. ○ Ability to solve physics problems.
Applying knowledge and understanding on:	<ul style="list-style-type: none"> ○ Knowledge of the main laws underlying physics, a necessary basis for the study of the scientific disciplines of the Course of Study. ○ Ability to interpret crucial principles of classical physics and apply them in the field of veterinary medicine.
Soft skills	<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ Upon completion of this course, the student should be able to interpret and discuss the major laws of physics and use them to their advantage in the field of veterinary medicine. • <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ The student should gain the correct scientific skills and terminology to be able to properly discuss the basic concepts of classical physics. • <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ The student should acquire the ability to improve his or her knowledge independently through further study, more advanced courses, and by putting the physics concepts learned into practice in the field of veterinary medicine.

Assessment and feedback



Methods of assessment	The evaluation of the learning achieved takes place through an oral test aimed at ascertaining the degree of knowledge of the proposed topics and a written test aimed at ascertaining the ability to solve classical physics exercises. The written test will last at least 2 hours and will consist of two problems, related to the first and second part of the program, and an open-ended question, related to any topic of the program
Evaluation criteria	<ul style="list-style-type: none">• <i>Knowledge and understanding</i><ul style="list-style-type: none">○ Know the main laws and notions of classical physics.○ Solve problems of classical physics• <i>Applying knowledge and understanding</i><ul style="list-style-type: none">○ Apply physics concepts learned in the field of Animal Science.• <i>Autonomy of judgment</i><ul style="list-style-type: none">○ Be able to independently identify the most appropriate law, formula, or notion to solve and interpret a classical physics problem.• <i>Communication skills</i><ul style="list-style-type: none">○ Have a good ability to expose proposed topics.• <i>Capacities to continue learning</i><ul style="list-style-type: none">○ Correctly respond to proposed questions and topics.
Criteria for assessment and attribution of the final mark	The evaluation of the learning achieved is done through an oral test to assess the degree of knowledge of the proposed topics and a written test to assess the ability to solve classical physics exercises. The written test will last at least 2 hours. The final grade will be the average of the grade of the written test and the oral test. The grade is expressed in thirtieths. The minimum grade to pass the exam is 18/30.
Additional information	