General information

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Academic subject	**Applied Physics - Exam: Mathematic and Physic**
Degree course	Animal Science
Academic Year	2021/2022
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic calendar (starting and ending date)	I Semester
Attendance	Mandatory

Professor/ Lecturer	
Name and Surname	Marianna La Rocca
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Telephone	
Department and address	Veterinary Medicine Campus – Valenzano (BA)
Virtual headquarters	Microsoft Teams
Tutoring (time and day)	To be arranged via email. On site or through Teams

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	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. 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. Mechanics Material Point Systems: Cardinal Equations of Dynamics for material point systems. Rigid Body Mechanics: Cardinal Equations of Dynamics for the rigid body, Statics: Cardinal Equations of Statics for the rigid body, Levers. 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 kinetic energy for ideal fluids - Bernouilli equation, Viscosity, Poiseuille equation, Blood flow in the human body. Thermology: temperature, thermometric scales, temperature meters. Thermodynamics: Thermodynamic System, Thermodynamic Equilibrium, Variables of State and Equation of State, Transformations, Work, Heat, Heat Transmission,

U.O. Didattica e servizi agli studenti
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	First Principle of Thermodynamics, Perfect Gases, Equation of State of Perfect Gases, Transformations of Perfect Gases, Perfect Gas Model, Kinetic Theory, Real Gases, Equation of State of Real Gases. Entropy. Second Principle of Thermodynamics. Electromagnetism and Electromagnetic Waves.
Books and bibliography	• Fondamenti di Fisica: Halliday, Resnick, Walker. Casa Editrice Ambrosiana • Fisica, Giancoli. Casa Editrice Ambrosiana • Slide delle lezioni.
Additional materials	

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:	o Knowledge of basic principles related to classical physics topics. o Ability to solve physics problems.
Applying knowledge and understanding on:	o Knowledge of the main laws underlying physics, a necessary basis for the study of the scientific disciplines of the Course of Study. o Ability to interpret crucial principles of classical physics and apply them in the field of veterinary medicine.

Soft skills	• *Making informed judgments and choices*
	  o 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.
	• *Communicating knowledge and understanding*
	  o The student should gain the correct scientific skills and terminology to be able to properly discuss the basic concepts of classical physics.
	• *Capacities to continue learning*
	  o 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 examination will be carried out through a written and an oral test. The evaluation criteria will be based on the accuracy of the qualitative and quantitative skills acquired by the student during the course.

Evaluation criteria	• *Knowledge and understanding*
	  o Know the main laws and notions of classical physics.
	  o Solve problems of classical physics
	• *Applying knowledge and understanding*

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	o Apply physics concepts learned in the field of Animal Science.
	• *Autonomy of judgment*
	  o Be able to independently identify the most appropriate law, formula, or notion to solve and interpret a classical physics problem.
	• *Communicating knowledge and understanding*
	  o Have a good ability to expose proposed topics.
	• *Capacities to continue learning*
	  o 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.
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