Academic subject: Applied Physics				
Degree Class: **L-38**		**Degree Course:** Animal Science	**Academic Year:** 2020/2021	
		Kind of class: mandatory	**Year:** I	**Period:** I semester
			ECTS: 6 divided into **ECTS lessons: 6** **ECTS** **exe/lab/tutor: 0**	

Time management, hours, in–class study hours, out–of–class study hours
                lesson: 48   exe/lab/tutor: 0   in–class study: 0   out–of–class study: 102

Language: Italian	**Compulsory Attendance:** yes	

Subject Teacher: **Emanuele Bisceglie**	**Tel: --** **e–mail:** emanuele.bisceglie@uniba.it	**Office:** Department of Room Floor	**Office days and hours:** Arranged by email

Prerequisites:
Knowledge on Elements of Mathematics

Educational objectives:
Students must know and be able to understand classical physics topics such as those related to the mechanics of the material point, the mechanics of systems of material points and rigid body, the mechanics of fluids, thermology, thermodynamics, electromagnetism, electromagnetic waves and topics of modern physics.

Expected learning outcomes (according to Dublin Descriptors)	**Knowledge and understanding: fair Knowledge** **Applying knowledge and understanding:** discreet competence. Problem solving skills about the topics developed during the course. Ability to collaborate in a working group through the assignment and feasibility study of a project. **Making judgements:** Self-assessment of degree of knowledge. Ability, with autonomy of judgement, in formulation and execution of experimental procedures as well as in modelling of the studied physical systems. **Communication:** Ability to develop the communication skills necessary for representing and discussing the fundamental arguments of the discipline. **Lifelong learning skills:** Comprehensive knowledge and skills of the acquisition and treatment methodologies of radiation for the investigation of nuclear and subnuclear physics processes. Skills and abilities that are essential for the profile of an expert in basic research.

Course program

Vectors, vector components, vector derivatives

kinematics, Displacement, velocity, acceleration, Motion with constant velocity and motion with constant acceleration, Free falling objects.

Projectile motion, Uniform circular motion. Angular acceleration, and centripetal acceleration, Motion with constant angular acceleration

Work and Energy, Kinetic energy, Work definition, Work-Energy principle, Conservative forces and Potential energy, Mechanical energy conservation, Potential energy of Gravitational, Elastic and central forces, Power.

Linear momentum, Momentum conservation, Collisions and impulse, Elastic and Inelastic collisions, Completely inelastic collisions.

Center of mass, Linear momentum of an extended system

Fluids. Fluids at rest: Pressure in fluids, Pascal's Principle, Stevino and Archimedes' Principle,

Hydrodinamics: Equation of continuity, Bernoulli's equation, Viscosity, Poiseuille's equation, Surface tension

Temperature, Temperature and thermometers, Thermal equilibrium and the zeroth law of thermodynamics, Thermal expansion, The Ideal Gas Law, Kinetic theory and the molecular interpretation of temperature , Real Gases

Heat, Heat as Energy Transfer, Internal energy, Specific heat, Calorimetry, Latent heat, Heat transfer: Conduction, Convection, and Radiation

Thermodynamic: Laws of thermodynamic, The first law of thermodynamics, The second law of thermodynamics, Entropy and the second law of thermodynamics.

Charge, Insulators and Conductors, Coulomb's law, The Electric Field, Electric potential, Electric potential energy and Potential Difference, Equipotential Line

Electric currents, Ohm's law: Resistance and Resistors, Resistivity, Electric power, Alternating current

Resistors in series and in parallel, Capacitors in Series and in Parallel

Magnetism, Magnets and Magnetic Fields, Gauss's Law, Magnetic Fields produced by currents, Ampère's Law, Faraday's Law of Induction.

Maxwell's Equations, Electromagnetic waves, The Electromagnetic Spectrum.

Medical application: CT Scanner, PET, TAC.

Teaching methods:
Classroom discussion and slide projection

Auxiliary teaching:
none

Assessment methods:
Written and oral examination. The evaluation acquired in this course, together with that of "Mathematics", will contribute to the determination of the final evaluation of integrated course of "Mathematics and Physics".

Bibliography:
Fondamenti di Fisica: Halliday,Resnick,Walker. Casa Editrice Ambrosiana Fisica, Giancoli. Casa Editrice Ambrosiana.