General information	
Academic subject	Physics
Degree course	Bachelor's degree in Natural Science
Academic Year	*2021-22*
European Credit Transfer and Accumulation System (ECTS)	*6*
Language	*Italian*
Academic calendar (starting and ending date)	*March-May 2022*
Attendance	

Professor/ Lecturer	
Name and Surname	Luigi Schiavulli
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Department and address	*Bari*
Virtual headquarters	*Teams*
Tutoring (time and day)	Moonday – Thursday 15.30-17.30

Syllabus	
Learning Objectives	*Knowledge of Classical Physics*
Course prerequisites	*Basic knowledge of basic mathematics: algebra, trigonometry, mathematical analysis.*
Contents	Scalar and vector quantities. Units of measurement systems. Dimensional equations. Measurement of a physical quantity and concept of error in measurements. **Mechanics**: space, time, speed (linear and angular), acceleration (linear and angular),mass, moment of inertia, forces, principles of dynamics, work and energy. Notes on dynamics of the rigid body. Notes on the properties of fluids: static and dynamic. **Thermodynamics**: thermometry, calorimetry, state of a thermodynamic system, pressure and work of pressure forces, perfect gases, first principle of thermodynamics, internal Energy, thermodynamic cycles and Carnot cycle, second thermodynamic principle, thermal machines and entropy. **Electromagnetism**: electric charge, Coulomb force, electric field, Gauss law, electrostatic Energy, electric potential, electric capacity and capacitors, electric current, alectric resi stance, Ohm's law. Magnetic field, Gauss law, Lorentz force and applications, Ampere's law, electric field and magnetic field, Faraday's law and applications. Maxwell laws. **Optics**: Electromagnetic waves, reflection and refraction of light (Snell's law). Mirrors and thin lenses: image formation. Elements of physical optics: polarization, interference and diffraction of light.
Books and bibliography	Serway- Jewett – Principi di Fisica vol. unico Edises
Additional materials	*The texts must be integrated with the lecture notes and appropriate websites recommended by the teacher.*

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	*40*	*15*	*95*
ECTS			
	5	*1*	

Teaching strategy	
	The teaching course is not delivered in e-learning mode.
Expected learning outcomes	
Knowledge and understanding on:	Basic knowledge of classical physics in particular of the topics of particular interest for the natural sciences. Insights into the basic concepts of dynamics: motion, mass, force. In-depth study of the concept of work and energy in mechanics, thermodynamics and electromagnetism. Insights into electromagnetic phenomena with particular emphasis on their practical and technological applications. They achieve this through teaching that provides the tools to: - in-depth study and bibliographic updating; - the study and analysis of particular physical processes; - learning the specialized language necessary to understand and communicate topics of interest in physics. These tools are transmitted with lectures, classroom exercises, in-depth analysis of some fundamental concepts with the help and consultation of websites. The verification of the educational results achieved takes place through simple oral numerical applications to be carried out during the semester of lessons and during the final exam.
Applying knowledge and understanding on:	Students are able to apply the knowledge acquired during the course to simple numerical applications. These applicative skills are acquired and verified through exercises, individual and group, essentially aimed at understanding and knowing how to use simple numerical problems in basic concepts of Physics.
Soft skills	• *Making informed judgments and choices* *Students are able to know and be able to apply the main concepts of classical physics in simple situations. Autonomy of judgment is acquired through the study and critical interpretation of texts. The achievement of adequate autonomy is verified through the exercises, which are held during the course, and with the final exam.* • *Communicating knowledge and understanding* Students are able to fully describe the main concepts of Classical Physics and apply them in simple situations. They are able to recognize and apply the main topics studied in the course also in other situations: from chemistry to biology and, in general, to the natural sciences. The achievement of an adequate level of communication skills is assessed in group activities, in the presentation of reports on individual research works, in the final exam. • *Capacities to continue learning*

	Students will have a sufficiently broad basic cultural background from the point of view. This allows them to independently undertake further in-depth study of topics in the field of Physics relating to the Science of Nature.

Assessment and feedback	
Methods of assessment	*Verification of learning will be carried out through oral interviews.*
Evaluation criteria	• *Knowledge and understanding* *Students must be able to understand the main topics of classical physics.* • *Applying knowledge and understanding* Students should be able to apply the concepts studied to simple problems. • *Autonomy of judgment* Students should be able to recognize physical concepts studied in situations other than those faced in the lessons. • *Communication skills* Students will have to achieve a sufficient ability to communicate the topics studied in a clear and comprehensive manner • *Capacities to continue learning* Students will have to achieve sufficient learning ability and autonomy in applying the main concepts studied in the course in various other disciplines.
Criteria for assessment and attribution of the final mark	*The student will have to show knowledge of the subject and the ability to use the notions learned in facing and solving numerical exercises.*
Additional information	