

<b>Main information on teaching</b>	<b>A.A. 2020-2021</b>
Course title	Physics
Degree Course title	Bachelor's degree in Natural Science
ECTS	6
Compulsory attendance	No
Course teaching language	Italian

<b>Responsible teacher</b>	Name and surname	Mail address and phone number
	Luigi Schiavulli	<a href="mailto:Luigi.schiavulli@ba.infn.it">Luigi.schiavulli@ba.infn.it</a> 0805443243
	Place and Time of reception	
	<b>Physics Dipartement Room 203 –Floor 2</b>	Moonday – Thursday 15.30-17.30

<b>ECTS Details</b>	<b>Disciplinary area/broad field:</b>	SSD	Credits
		FIS 01	6

<b>Time management and teaching activity type</b>	
Period	II semester
Year	I
Lesson type	Frontal lessons

<b>Time management</b>	Frontal lessons:	Exercises:
Total hours	125	25
In-class/in-lab study hours	40	15
Out-of-class study hours	$(25-8) \times 5 = 80$	$(15 \times 1) = 15$
Credits	5	1

<b>Course calendar</b>	
Starting date	First week of March 2021
Ending date	First week of June 2021

<b>Syllabus</b>	
<b>Prerequisites</b>	Basic knowledge of basic mathematics: algebra, trigonometry, mathematical analysis.
Obligatory Prerequisites	None.
Expected learning outcomes (according to Dublin Descriptors)	<b>Knowledge and understanding:</b> Basic knowledge of classical physics, in particular topic of specific interest for natural sciences. Insight into the basic concepts of dynamics: motion, mass, forces. Deepening of the concept of work and energy in mechanics, thermodynamics and electromagnetism. Insights into electromagnetic phenomena placing particular emphasis on their practical and technological applications.

	<p><b>Applying knowledge and understanding</b> Students are able to apply the knowledge acquired during the course to simple numerical applications. These application skills are acquired and verified through individual and group exercises, aimed essentially at understanding and knowing how to use basic numerical problems in basic concepts of physics.</p> <p><b>Judgment autonomy</b> Students are able to know and apply the main concepts of classical physics in simple situations. Autonomy of judgment is acquired through the study and critical interpretation of texts. The achievements of adequate autonomy is verified through exercises which are held during the course and with the final profit exam.</p> <p><b>Communication skills.</b> Students are able to fully describe the main concept of classical physics and to 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 natural science</p> <p><b>Learning ability</b> Students will have a sufficiently large cultural background. This allows them to undertake independently further study between topics in the field of Physics and those related to the science of Nature.</p>
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Syllabus	
Teaching content.	<p>Scalar and vector quantities. Units of measurement systems. Dimensional equations. Measurement of a physical quantity and concept of error in measurements.</p> <p><b>Mechanics:</b> 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.</p> <p><b>Thermodynamics:</b> 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.</p> <p><b>Electromagnetism:</b> electric charge, Coulomb force, electric field, Gauss law, electrostatic Energy, electric potential, electric capacity and capacitors, electric current, electric resistance, 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.</p> <p><b>Optics:</b> 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.</p>
Reference text	Serway- Jewett – Principi di Fisica vol. unico Edises
Notes to the reference texts	Texts must be integrated with the lecture notes and appropriate websites recommended by the teacher.
Teaching Methods	Frontal lessons sometimes supported by presentations with PPT, numerical exercises on the topics covered in the lessons.
Judgement methods	Written and oral test.
Judgement criteria	<p><b>Knowledge and understanding.</b> Students must be able to understand the main topics of classical Physics</p> <p><b>Ability to apply knowledge and understanding.</b></p>

	<p>Students should be able to apply the studied concepts to simple numerical exercises.</p> <p><b>Judgment autonomy</b> Students must be able to recognize the physical concepts and to apply in different situations.</p> <p><b>Communication skills.</b> Students must reach a sufficient capability in order to communicate the topics studied in a clearly and comprehensively way.</p> <p><b>Learning ability</b> Students must reach a sufficient learning capability and autonomy in applying the mai concepts studied during ther course in various other disciplines.</p>
Other	