Main course information	
Academic subject	Geberal Physics
Degree course	Bachelor's Degree in Nature Sciences
Degree class	L-32
ECTS credits (CFU)	6
Compulsory attendance	Strongly recommended
Teaching language	Italian
Accademic Year	2019/2020

Professor/Lecturer	
Name & SURNAME	Luigi Schiavulli
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Tutorial time/day	Monday and Thursday 3:00 pm to 5:00 pm at your studio. Moreover, if not involved in other institutional activities, it is available at the room 203 (physics department) every day by telephone and / or e-mail appointment.

Course details	Exam with mark	SSD code	Type of class
		Fis/07	Lecture/workshop

Teaching schedule	Year	Semester
	First	Second

Lesson type	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	5	40			1	15		

Time management	Total hours	Teaching hours	Self-study hours
	150	55	95

Academic Calendar	First lesson	Final lesson
	02.03.2020	05.06.2020

Syllabus	
Course entry requirements	Basic knowledge of mathematics: algebra, trigonometry, analytic geometry in the plane and mathematical analysis
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
Knowledge and understanding	The student will have to acquire further knowledge specifically on Classical Physics by understanding the main basic concepts. In particular, he will have to study in deep the basic concepts of dynamics: motion, mass, force. In particular, the concepts of work and energy in mechanics, in thermodynamics and electromagnetism. Furthermore, it will have to focus on electromagnetic phenomena with particular emphasis on their practical and technological applications.
Applying knowledge and understanding	The student must acquire methodology and useful contents for the natural sciences. The student will be invited to the classroom to compare the knowledge acquired during the lesson with simple numerical exercises in order to reach a full knowledge of the theoretical tools addressed in the lesson.
Making informed judgements and choices	The student will have to acquire autonomy in areas related to the evaluation and interpretation of experimental data and in the setting of the strategies of application of physical techniques. To this end, they will be invited individually and collectively to discuss case studies proposed during the lessons.
Communicating knowledge and	The student will have to acquire the vocabulary and terminology of Physics in order to

understanding	be able to understand any further information through a specific bibliography. For this purpose the students will be invited to express in concepts learned during the lessons with autonomy and precision of the language.
Capacities to continue learning	The student will be able to have the ability to understand the the discipline with a critical spirit also through an autonomous consultation of texts. This ability will be stimulated with questions during the lessons.

Syllabus	
Course content	Scalar and vector quantities. Measure, tools and units. Scalar and vector fields. MECHANICS Main dimensions: space, time, speed (linear and angular), acceleration (linear and angular), mass, moment of inertia, forces, moment of forces, work and energy. The principles of dynamics. Examples of Forces. Work-energy in translations: theorems of kinetic energy and potential energy. Conservation of mechanical energy. Work-energy in rotations. Practical applications. Fundamentals of fluid mechanics: Stevino's law, Pascal's principle and Archimedes' principle. Bernoulli's theorem. THERMODYNAMICS Heat and temperature. Thermal expansion and thermometers. Gas and equation of state of perfect gases. State of a gas and thermodynamic transformations. Heat, work and internal energy.1 ° Principle of thermodynamics. 2nd Principle of thermodynamics and thermal machines, Entropy. ELECTRICITY Electric charge. Coulomb force and electricity. Field and electric potential. Electric currents and electrical power supply. Conductors and insulators. Ohm and Joule laws. Resistors, capacitors, diodes, fuses and their use. Kirchhoff's laws. Electrical measurements and verifications. MAGNETISM Magnets as magnetic field sources: the magnetic dipole. The earth's magnetic field. Electric currents as magnetic field sources. Straight thread, loop and solenoid. Ampere equivalence principle. Actions of a magnetic field on magnets and wires. Electromagnetic induction and applications. Inductance and RL circuits. WAVES Wave motion and examples. Mechanical and acoustic waves. Oscillations and electromagnetic waves. The electromagnetic spectrum. X-ray diffraction. Theoretical arguments will be supported by numerical exercises.
Course books/Bibliography	Serway-Jewett – Principi di Fisica ed EdiSes
Notes	Lecture notes and insights on some websites
Teaching methods	Lectures and numerical exercises on the theoretical topics addressed in the course
Assessment methods (indicate at least the type written, oral, other)	Written test and oral exam concerning the topics covered in the program carried out in the theoretical lessons and in numerical exercises. Regular and active participation during class hours will contribute to a very positive evaluation.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	**Knowledge and understanding** In addition to ascertaining the acquisition of concepts, the ability to know how to use the concepts acquired through simple numerical applications will be evaluated. **Ability to apply knowledge and understanding** Furthermore, it is necessary to have clear the possible connections of the knowledge acquired during the lessons with the applications in the natural sciences. The knowledge of only the notions is not evaluated beyond an average evaluation (24 - 26/30) **Autonomy of judgment** The student during the exam must be able to independently develop connections with other disciplines included in his / her study path. This ability will lead to a very positive assessment of the exam. **Communication skills** The ability to express the concepts learned during the lessons with rigor and clarity will be evaluated positively. **Learning ability** The student must be able to acquire further knowledge with the aim of achieving an interdisciplinary preparation. Having acquired these skills will lead to an increase in the final grade up to the maximum.
Further information	