UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Matematica e Informatica
ACADEMIC YEAR	2016/2017
BACHELOR'S DEGREE (BSC)	MATHEMATICS
SUBJECT	PHYSICS 1
TYPE OF EDUCATIONAL ACTIVITY	A
AMBIT	50196-Formazione Fisica
CODE	13867
SCIENTIFIC SECTOR(S)	FIS/02
HEAD PROFESSOR(S)	MICELI MARCO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	145
COURSE ACTIVITY (Hrs)	80
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**MICELI MARCO** Wednesday 14:30 16:30 Dipartimento di Fisica e Chimica, via Archirafi 36 (con prenotazione via email) Thursday 14:30 16:30 Dipartimento di Fisica e Chimica, via Archirafi 36 (con prenotazione via email)

DOCENTE: Prof. MARCO MICELI

PREREQUISITES	basic knowledge of algebra, geometry, and trigonometry
LEARNING OUTCOMES	Knowledge and understanding: organic knowledge of the fundamental laws of Newtonian mechanics, hydrodynamics, and classical thermodynamics. Applying knowledge and understanding: The student will develop the capability to describe the physical phenomena analytically and to express the mechanical and thermodynamic processes in terms of simple systems, thus developing appropriate models. Making judgments: students will be able to recognize and classify physical processes, to independently choose the best strategy for the resolution of physical problems and the laws to apply. The student will be able to critically evaluate the results obtained. Communication: Special care will be dedicated to the acquisition of a rigorous scientific language. The student will be able to articulate clearly and concisely the fundamental laws of Newtonian mechanics and classical thermodynamics, pinpointing the connections with the other courses. Lifelong learning skills: the students will acquire a method for the study of physical processes which will be useful in subsequent applications and further studies. In particular, they will know how to describe the observed phenomena in quantitative terms, by adopting appropriate physical quantities. They will also be able to decompose complex phenomena into their elementary terms and will interpret them, by using the laws of classical physics.
ASSESSMENT METHODS	Written and oral exam. The written test is aimed at verifying the capability of the students to solve problems of classical physics by applying the notions acquired. The test consists of 5 exercises (two exercises on kinematics and particle mechanics; one exercise on the mechanics of rigid bodies (and systems of particles), one exercise on hydrodynamics, and one on thermodynamics), to be solved in three hours. If the written test is passed, the examinee has to take the oral exam, consisting of a minimum of two/three questions on the course program. The student must demonstrate, with adequate language skills, his knowledge and understanding of the course program. The evaluation criteria are as follows: i) Excellent (30-30 cum laude): excellent knowledge and understanding of the topics, excellent language skills, advanced capability of applying the notions acquired for problem solving; ii) Very good (26-29): good knowledge of the course program and good language skills, good capability of applying the notions acquired for problem solving; iii) Good (22-25): good knowledge of the course program, but without a deep understanding of all its aspects, limited capability of independently applying the notions acquired for problem solving iv) Fair (18-21): modest understanding and minimum basic knowledge of the course program, difficulties in the resolution of the exercises, limited language skills; v) Poor: lack of understanding of basic subjects, limited knowledge of the course program.
EDUCATIONAL OBJECTIVES	Deep knowledge and understanding of classical physics (mechanics, hydrodynamics, and thermodynamics); knowledge of the scientific method; capability to address and discuss problems of classical physics.
TEACHING METHODS	Lectures and exercises
SUGGESTED BIBLIOGRAPHY	- D. Halliday, R. Resnick, K. Krane, FISICA 1, Editrice Ambrosiana- Milano - R.A. Serway, R.Jewett, Fisica per Scienze ed Ingegneria, Vol. I, Quarta Ed. (2009), Edises - P. Mazzoldi, M. Nigro, C. Voci, Elementi di Fisica – Meccanica e termodinamica, II Ed. (2008) Edises - Fermi E., Termodinamica, Bollati Boringhieri Editore

SYLLABUS

Hrs	Frontal teaching
6	Physical quantities, definition and measures. Scalars and vectors. Particle kinematics
8	Newton's laws and particle mechanics. Newton's law of universal gravitation. Inertial and non-inertial systems
12	Work. Impulse. Conservative forces and potential energy. Mechanical energy, momentum, angular momentum and its conservation. Momentum and collisions. Small oscillations.
6	Dynamics of system of particles and rigid bodies. Statics
6	Hydrostatics. Hydrodynamics
6	Zeroth law of thermodynamics and thermal equilibrium. Thermometry and calorimetry. Kinetic theory of ideal gas.
12	Thermodynamic processes. First law of thermodynamics. heat engines, Carnot cycle and Carnot theorem. Second law of thermodynamics and entropy.

Hrs	Practice
24	Solving excercises and problems