



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2021/2022
BACHELOR'S DEGREE (BSC)	DIGITAL ENTERPRISE INNOVATION ENGINEERING
SUBJECT	PHYSICS 1
TYPE OF EDUCATIONAL ACTIVITY	A
AMBIT	50284-Fisica e chimica
CODE	03295
SCIENTIFIC SECTOR(S)	FIS/03
HEAD PROFESSOR(S)	PAGANO PAOLO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	144
COURSE ACTIVITY (Hrs)	81
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	PAGANO PAOLO Tuesday 11:30 13:30 Dipartimento di Fisica e Chimica, in via Archirafi, 36.Stanza 109.

PREREQUISITES	General concepts of mathematical analysis, elementary algebra and geometry with basics of trigonometry. Vector Analysis. Calculation of derived functions and some simple integrals. Resolution of simple ordinary differential equations.
LEARNING OUTCOMES	Knowledge and understanding The student at the end of the course will have knowledge of the issues involved with Classical Physics. In particular, the student will be able to understand issues related to metrology, the basic principles of Classical Mechanics, the laws of fluid dynamics and the fundamental principles of thermodynamics. In addition, the student will have basic knowledge of Modern Physics. Applying knowledge and understanding The student will have acquired their own methods of Classical Physics and will be able to apply the basic principles to practical situations. In particular it will be able to use the equations of Classical Physics to solve problems of mechanics of the material point and rigid body, problems of fluid dynamics and thermodynamics. Making judgments The student will be able to apply the general scientific methodology to solve problems and deal with a scientific approach new problems; also acquire the ability to model phenomena in a simple and complex problems. Communication skills The student will acquire the ability to express concepts of physics related to the course with appropriate and rigorous terminology. Learning ability The student will have the ability to learn new complex issues such as basic principles of classical physics; This will allow him to continue his engineering studies with greater autonomy and later to face the profession with a wealth of fundamental knowledge essential in the planning stages.
ASSESSMENT METHODS	A Written Exam + an Oral Exam. 1. Assessment procedure for the Written Exam The Written exam consists of from 3 to 6 problems to be solved on the following topics: mechanics of a material point, mechanics of point systems or rigid bodies, and fluids dynamics or thermodynamics. Each issue includes results to be calculated in a literal form or in digital form. The written examination will seek to determine the possession of skills, abilities and skills required. The stimuli, well-defined, clear and interpretable only, allow to formulate independently the response, and are structured so as to ensure comparability. The closing of the stimulus and the response is used to determine a priori, that is, at the time of the test construction, and therefore before it is administered, the score to be assigned to each question depending on the answer proves correct, incorrect or misleading statement. The assessment is expressed in thirtieth and admission to oral test is determined by a minimum score. 2. Evaluation criteria for the oral examination The oral test consists of an interview, in order to check that you have skills and knowledge disciplinary provided by the course; the evaluation is expressed in thirtieths. The questions, both open both semi-structured and specifically designed to test the results of learning provided for, will tend to occur) the knowledge captured; b) the processing capacity, c) have adequate display capacity on the course contents: mechanics of material point, mechanics of point systems, fluid dynamics and thermodynamics. In particular will demand the ability to establish connections between the content (theories, models, tools, etc.). The final evaluation will take into account both the score of the Written Exam than that of the Oral Exam. In particular, the average is usually made between the two tests, except in the case of a particularly brilliant oral test weighed by weight up to 0.8 the oral test. Excellent 30-30 and praise, very good knowledge of the topics, excellent properties of language, good analytical ability, the student is able to apply knowledge to solve problems proposed 26-29 Very Good, Good command of the topics, full of language, the student is able to apply knowledge to solve problems proposed 24-25 good, basic understanding of the main topics, discrete properties of language, with limited ability to independently apply the knowledge to the solution of the proposed problems Satisfactory 21-23, has not fully mastered the main teaching subjects but it has the knowledge, satisfactory property language, poor ability to independently

	apply the knowledge acquired Sufficient 18-20, Minimum basic understanding of the major teaching and technical language issues, very little ability to independently apply the knowledge acquired Insufficient, it does not have an acceptable knowledge of the contents of the topics covered in the teaching.
EDUCATIONAL OBJECTIVES	This teaching will provide the students with a fundamental overview of classical mechanics and thermodynamics. The course has a special focus on the scientific method and on how to solve problems. Furthermore, also elements of modern physics will be mentioned. The goal is for students to solve basic problem of classical physics on the topics covered during the teaching, to apply the scientific method to problem solving. Such goals are key for the continuation of engineering studies with the required independence and to provide a professional engineer with fundamental knowledge for planning.
TEACHING METHODS	Lectures and tutorials.
SUGGESTED BIBLIOGRAPHY	- Mazzoldi-Nigro-Voci, Elementi di Fisica (Meccanica e Termodinamica), EdiSES- Napoli ISBN 978-88-7959-418-9 ISBN 978-88-7959-478-3 - Serway, Principi di Fisica, EdiSES- Napoli ISBN 978-88-7959-864-4 - John R. Gordon, Ralph V. McGrew, Raymond, A. Serway, John W. Jewett, Esercizi di Fisica guida ragionata alla soluzione, vol.I, EdiSES- Napoli ISBN 978-88-7959-556-8

SYLLABUS

Hrs	Frontal teaching
2	Historical background. Objectives of teaching and structure of the course. Unity of measure and measurements.
8	Kinematics of particles. Vectors, velocity and acceleration. Uniform motion, motion with constant acceleration, motion in to dimensions. Parabolic, circular, and oscillatory motion.
16	Dynamics of point particles. Principles of dynamics. Statics. Gravity force, constraint reaction forces, elastic forces. Work of a force. Kinetic energy and potential energy. Conservation of mechanical energy.
8	Dynamics of systems of point particles. Motion of the centre of mass. Momentum. Conservation of momentum. Elastic and inelastic collisions.
8	Rigid bodies. Angular momentum. Momentum of inertia. Rotation and rolling of a rigid body.
3	Fluid dynamics
9	Thermodynamics
Hrs	Practice
10	Kinematics and dynamics
8	Rigid bodies
9	Fluid dynamics and thermodynamics