UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2020/2021
BACHELOR'S DEGREE (BSC)	CHEMICAL AND BIOCHEMICAL ENGINEERING
SUBJECT	PHYSICS I
TYPE OF EDUCATIONAL ACTIVITY	A
AMBIT	50293-Fisica e chimica
CODE	15540
SCIENTIFIC SECTOR(S)	FIS/03
HEAD PROFESSOR(S)	CORSO PIETRO PAOLO Ricercatore 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	**CORSO PIETRO PAOLO** Wednesday 8:00 9:00 Locali Ed. 6 Thursday 8:00 9:00 Locali Ed. 6

DOCENTE: Prof. PIETRO PAOLO CORSO

PREREQUISITES	General concepts of algebra and geometry. Solving quadratic equations and simple linear equations. Basic knowledge of polynomial, exponential, logarithmic, trigonometric functions.
LEARNING OUTCOMES	Knowledge and understanding: at the end of the course students will have gained a comprehensive understanding of the fundamental laws of Newtonian mechanics, fluid dynamics, oscillations and classical thermodynamics. To this end, during the lessons we will focus on the most important concepts and core principles from time to time presented, both directly and via use of targeted exercises. Applying knowledge and understanding: the student will be able to describe mechanical and thermal phenomena of the macroscopic world by means of mechanics and classical thermodynamics, in terms of simple systems and to apply the laws of physics to the model used for their description. Particular attention will be given, where possible, to the recall of common natural phenomena. Making judgments: students will be able to recognise and classify physical processes, will independently choose how to solve the physical problems and the laws to apply. The student will also be able to critically evaluate the obtained results, frequently attracted and stimulated during the lessons through direct interaction student/teacher, mostly during classroom exercises. Communication skills: the student will be able to explain, in a clear and concise way, the meaning of the fundamental laws of Newtonian mechanics and classical thermodynamics, knowing grasp the connections with the topics covered in the courses taken in the same semester. Learning ability: the student, at the end of the course, will have acquired a method for the study of physical processes that can be useful in subsequent applications and further study. In particular, students will be able to describe the observed phenomena in quantitative terms using the appropriate physical quantities; he/she will be also able to break down a complex phenomenon into elementary phenomena and interpret them by using the laws of classical physics.
ASSESSMENT METHODS	The evaluation of learning is performed by means of two tests, one written and one oral. 1) The assessment procedure of the Written Test The Written Test consists of 4 problems aiming to assess the degree of learning about the different concepts of the program topics: - a problem about particle dynamics; - a problem about either point systems or rigid bodies dynamics; - a problem of static or oscillation; - a problem about thermodynamics. The written examination will seek to determine the possession of skills, capacities and the responsibilities under the program of the course. The text of the problems is formulated in such a way as to indicate clearly and, in the case of multiple answers, schematically the required results. Each problem is assigned a vote from 0 to 30 depending on the degree of accuracy and completeness of the response. The overall assessment, expressed in thirtieth, is the result of the average of the marks obtained in each of the individual problems. Admission to oral test is determined from a minimum score of 15. 2) The assessment procedure of the Oral Exam The Oral Exam consists of an interview meant to check if the student has acquired skills and disciplinary knowledge provided by the course program; the evaluation is expressed in thirtieths. The questions, both open and semi-structured and specifically designed to test the results of learning provided, tend to occur: a) the gained knowledge; b) the processing capacity; c) the possession of an adequate exposure capacity on the course contents: mechanics of the material point, mechanics of point systems, fluid dynamics, statics, oscillations and thermodynamics. In particular it will be required the ability to establish connections between the content (theories, models, tools, etc.). Questions can also be based on analysing the solution of the problems mentioned in the written test. The final evaluation takes into account the scores of both Oral and Written Exams. The final score is attributed according to the following scheme: - 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; - Very Good, 26-29: good command of the topics, full of language, the student is able to apply knowledge to solve problems proposed; - Good, 24-25: 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; - Insufficient: it does not have an acceptable knowledge of the contents of the topics covered in the teaching. Rating: Vote Outcome
EDUCATIONAL OBJECTIVES	Adequate knowledge of the methodological and operational aspects related to the subject matter of the course and the ability to use that knowledge to interpret and describe engineering problems. In particular, students will become familiar with the kinematics of the point, the dynamics of point systems and rigid bodies, with the concepts of momentum, angular and mechanical energy, oscillations as well as with the laws of statics; a part of the course will be devoted to the introduction of classical thermodynamics and the kinetic theory of gases. The educational objectives are also reported in the Academic Regulations for the Course.
TEACHING METHODS	Frontal lessons. Classroom exercises.
SUGGESTED BIBLIOGRAPHY	R.A. Serway, R. Jewett, Fisica per Scienze ed Ingegneria, Vol. I, Quarta Ed., Edises P. Mazzoldi, M. Nigro, C. Voci, Elementi di Fisica – Meccanica e termodinamica, Edises P.P. Corso, Raccolte di Esercizi

SYLLABUS

Hrs	Frontal teaching
1	Course objectives. Historical Introduction.
2	Measures and physical quantities.
4	Vectors and fundamentals of calculus.
6	Kinematics.
7	Dynamics of a particle.
6	Dynamics of point systems.
7	Dynamics of rigid bodies.
3	Statics.
3	Fluid dynamics.
4	Oscillations.
10	Thermodynamics.

Hrs	Practice
2	Kinematics.
4	Dynamics of a particle.
4	Dynamics of point systems.
4	Dynamics of rigid bodies.
3	Statics.
2	Fluid dynamics.
3	Oscillations.
5	Thermodynamics.