Syllabus

Descrizione corso

Titolo insegnamento	Fisica I
Codice insegnamento	42445
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	FIS/01
Lingua	Inglese
Corso di Studio	Corso di laurea in Ingegneria elettronica e dell'Informazione
Altri Corsi di Studio (mutuati)	
Docenti	prof. Franco Cacialli, Franco.Cacialli@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/47601 dr. Riccardo Zamboni, Riccardo.Zamboni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/51510
Assistente	dott. Fahimeh Masoumi dott. Matteo Boggiatto
Semestre	Secondo semestre
Anno/i di corso	1
CFU	7
Ore didattica frontale	48
Ore di laboratorio	32
Ore di studio individuale	95
Ore di ricevimento previste	21
Sintesi contenuti	The course aims to give the attendants a scientific basis in classical mechanics and thermodynamics, as well as practical methods and the ability to solve problems related to the same topics.
Argomenti	1. Measurement and vectors: units of measurement, dimensions of

dell'insegnamento	physical quantities, mathematical operations with vectors.
	2. Kinematics: average and instantaneous velocity and acceleration, uniformly accelerated motion.
	3. Dynamics: Newton's three axioms, gravitation, work, energy, law of conservation of energy, linear momentum, collisions, centre of mass.
	4. Rotation: angular displacement, average and instantaneous angular velocity and acceleration, torque, moment of inertia, angular momentum, general rotation.
	5. Statics: Static equilibrium, stress-strain, Young's modulus.
	6. Fluidics: Ideal fluids, Pascal's and Archimedes' principles, Bernoulli's equation.
	7. Thermodynamics: thermal expansion, kinetic theory of gases, heat, ideal gases, zeroth, first and second law, circular processes, Carnot cycle, entropy.
Parole chiave	mechanics, kinematics, dynamics, statics, fluids, thermodynamics,
Prerequisiti	Calculus 1
Insegnamenti propedeutici	
Modalità di insegnamento	Frontal lectures, exercises, labs
Obbligo di frequenza	Attendance is not mandatory but strongly recommended
Obiettivi formativi specifici e risultati di apprendimento attesi	Knowledge and understanding Knowledge and understanding of physical laws of: 1. Basics of Physics 2. Kinematics 3. Dynamics 4. Statics 5. Fluids 6. Thermodynamics Applying knowledge and understanding 7. Ability to analyse and solve problems on mechanics, fluid dynamics and thermodynamics.

	Making judgements 8. Students are expected to develop the ability to judge the plausibility of results. Communication skills 9. Further development of a quantitative, technical, and scientific terminology to express ideas and opinions about physical phenomena. Ability to learn 10. Development of an analytic attitude enabling the student to divide a problem into sub-tasks which can be solved using previously-acquired knowledge.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Summative assessment Form: Written and oral (at the discretion of the examiner(s), based on the results of the written component) Details: Closed book exam ILOs assessed: 1-10
Criteri di valutazione	The exam includes a written and an oral component. The written exam (2.5 hours) consists of two parts: a first part (problem 1) with a series of (mostly) qualitative or semi-quantitative questions based on the understanding of the topics covered in the lectures, as well as a second part (problems 2-5) consisting of several numerical or symbolic problems to be solved related to the various topics covered in the lectures. Grading will be based upon: - The correctness of the approach and the mathematical steps of the solution, the calculation of numerical results and the correct use of physical quantities and units. - The correctness of the provided answers and of the presented, as well as the terminology used. To pass the exam the final grade must be greater or equal to 18. If the final score is greater than 30, a "cum laude" grade is awarded.

	The student can have access to the exam with pen, pencil and a portable calculator. A short list of constants is provided to the students along with the text of the exam. Students should also be able provide proof of identity (e.g. Campus card, ID card, passport) before the start of the exam. Depending on the outcome of the written exam students may be invited, at the discretion of the examiner(s), to an oral exam that may include questions on the programme covered in the lectures (including those of the written part of the exam) and related problems. The oral component may lead to an increase or a reduction of the grade of the written component. Students should also be able provide proof of identity (e.g. Campus card, ID card, passport) before the start of the exam.
Bibliografia obbligatoria	Blackboard / lecture slides
Bibliografia facoltativa	· *Physics for Scientists and Engineers with Modern Physics*, Douglas C. Giancoli, Pearson, 4th edition, 2008. Also available in electronic format (pdf) from UNIBZ library. · *Physics for Scientists and Engineers*, Paul A. Tippler, Macmillan, 6th edition, 2007 Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it
Altre informazioni	
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità