



# UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

PHYSICS II	
Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	FIS/03 (MATERIAL PHYSICS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	9
Lesson hours	72 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	CRISTIANI ILARIA (titolare) - 9 ECTS
Prerequisites	Concepts and methods from 1st year courses. In particular: vector calculus identities, derivatives, theorems on gradient, divergence and curl.
Learning outcomes	Learning of electromagnetism principles and laws, stationary and time-dependent, including simple analysis methods.
Course contents	Electric phenomena in vacuum Coulomb force; electric field, potential energy and electric potential Electrical phenomena in dense media Conductors, capacitors, dielectrics, electric current Magnetic phenomena in vacuum Lorentz force, magnetic field, Biot-Savart law, Ampère law, induction Magnetism in the matter Fields M and H

	<p>Electromagnetic waves in vacuum</p> <p>Maxwell equations, energy, power and intensity of the field, radiation pressure</p> <p>Interference, diffraction and polarization</p> <p>Waves in dense media</p> <p>Reflection, refraction, optics</p>
<b>Teaching methods</b>	<p>Lectures (hour/year): 45</p> <p>Excercise classes (hour/year): 38</p> <p>Practical activities (hour/year): 0</p> <p>Lectures are based on explanations and practical examples, using the blackboard.</p> <p>Excercise classes consists in solution of problems and exam exercises on the blackboard, encouraging students' active participation.</p>
<b>Reccomended or required readings</b>	<p>Reference textbook: Mazzoldi-Nigro-Voci, ISBN: 8879591525.</p> <p>There are many equivalent textbooks, however.</p> <p>Brief lectures videos prepared by the teacher and covering the whole course are available on the e-learning platform KIRO, including notes and useful links: see <a href="http://www-3.unipv.it/fis/fisica2/ElInfoBio/index.pdf">http://www-3.unipv.it/fis/fisica2/ElInfoBio/index.pdf</a></p>
<b>Assessment methods</b>	<p>Final exam will be written, with optional oral if the score of the written exam is 24/30 (maximum possible).</p> <p>The written exam lasts 2h and consists of 6 exercises. Correct solution of 2-3 of these normally is sufficient for a positive exam.</p> <p>The oral exam starts with a revision of the written part, then further questions on general topics of the course will be asked, their complexity depending on the student's knowledge. Oral exam lasts 15-20 minutes.</p>
<b>Further information</b>	
<b>Sustainable development goals - Agenda 2030</b>	<p><a href="#">\$lbl legenda sviluppo sostenibile</a></p>