



## Subject card

Subject name and code	Modern Physics, E:37034W0						
Field of study	Informatics						
Date of commencement of studies	October 2014		Academic year of realisation of subject		2015/2016		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Katedra Fizyki Atomowej, Molekularnej i Optycznej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Ryszard Twardowski				
	Teachers		dr Ryszard Twardowski  mgr inż. Bożena Żywicka  dr Tomasz Neumann  dr inż. Patrycja Stefańska-Ptaszek				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		0.0		0.0	30
Subject objectives	Providing the student with the basic knowledge of physics helpful in father education.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K_U12		The ability of interpretation of the basic physical phenomena. Ability to perform simple measurements of physical quantities.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K_W14		Student lists and explains the basic physical phenomena, concepts and laws concerning electromagnetism, theory of relativity and basics of quantum mechanics.		[SW1] Assessment of factual knowledge		
Subject contents	Electromagnetism. The vector electric field property. Magnetic field in vacuum. Electric and magnetic field of moving charge. Biot-Savart law. Magnetic field around a long wire. Lorentz force. Magnetic force on a current carrying wire. Ampere's laws. Interaction of two parallel long wires. Faraday's law. Maxwell's equations. Einstein's postulates. Lorentz transformation and its consequences. The polarization of light. Black body radiation. Photoelectric phenomenon. Compton effect. Bohr model. Wave-particle duality. De Broglie's hypothesis. The Heisenberg uncertainty relations. Schrodinger's wave equation - examples of solutions. Hydrogen atom and hydrogen-like ion. Spin of an electron. Emission and absorpotion of light. Stimulated emission. Laser operation principle.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			50.0%		0.0%		

Recommended reading	Basic literature	<p>1. Twardowski R., Notatki wykładowe, <a href="http://www.mif.gda.pl/homepages/ryrt">www.mif.gda.pl/homepages/ryrt</a></p> <p>2. Sawieliew I.W. Wykłady z fizyki, PWN, Warszawa, 2013</p> <p>3. Materiały dydaktyczne do laboratorium, <a href="http://www.mif.gda.pl/">www.mif.gda.pl/</a></p>
	Supplementary literature	<p>1. Halliday D., Resnick R., Walker J., Podstawy fizyki, tom 1-5, PWN, Warszawa</p> <p>2. Bobrowski Cz., Fizyka, WNT, Warszawa 2004.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Electromotive force of electromagnetic induction. Faraday's law.</p> <p>A quantum particle in the infinite potential well.</p>	
Work placement	Not applicable	

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