

§ GDAŃSK UNIVERSITY § OF TECHNOLOGY

Subject card

Photophysics of biological systems, PG_00046105								
Technical Physics								
February 2023		Academic year of realisation of subject			2023/2024			
second-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study				
Full-time studies		Mode of delivery			at the university			
2		Language of instruction			Polish			
3		ECTS credits			1.0			
general academic profile		Assessment form			assessment			
Instytut Fizyki i Informatyki Stosowa		nej -> Faculty of Applied Physics and Ma				lathematics		
1e Subject supervisor		dr inż. Marcin Dampc						
Teachers		dr inż. Marcin Dampc						
Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
Number of study hours	15.0	0.0	0.0	0.0 0.0 15		15		
E-learning hours included: 0.0								
Address on the e-lear	ning platform:	: https://enauczanie.pg.edu.pl/mood		noodle/	course/view.php?id=10282		0282	
Learning activity	Participation in classes includ plan	n didactic ed in study	Participation i consultation h	n Iours	Self-study		SUM	
Number of study hours	15		1.0		9.0		25	
The interactions between emectromagnetic radiation and biological systems will be presented and discussed. Biological systems will be represented by wide range of systems from isolated biomolecules to macroscopic sytems. Phenomena of radiation absorption and emission will serve as a foundation for further discussion of photochemistry in biosystems.								
Course outcome		Subject outcome			Method of verification			
[K7_W03] Has general knowledge of current development paths and discoveries in the scope of physics and related fields of science and technology.		Can select the appropriate experimental technique for investigating phenomenta.		[SW1] Assessment of factual knowledge				
[K7_W02] Has enhanced, theoretically-founded, detailed knowledge of selected field of physics, and sufficient knowledge of related fields of science or technology.		Fully understand excitation processes in molecules and atoms.			[SW1] Assessment of factual knowledge			
Radiation interactions with matter. Electronic, vibrational, rotational excitation. Photoionization. Fragmentation. Jabłoński`s diagram. Radiatian emission. Photochemistry. Multiphoton processes. Femtosecond photophysics. Free radicals. Photosynthesis. Radiation demage to DNA. Bioluminescence. Clinical phototherapies.								
Introduction to spectro	oscopy.							
Subject passing criteria		Passing threshold		Percentage of the final grade				
Written assessment		50.0%		50.0%				
Seminar		50.0%						
Basic literature		 2. Kęcki Introduction to molecular spectroscopy" PWN 1975 2. P. Suppan Chemistry and light, PWN 1997 						
Supplementary literature		1. B. Mielewska "Biophysics" Wydawnictwo PG, 2015						
	Photophysics of biolog Technical Physics February 2023 second-cycle studies 2 3 general academic pro Instytut Fizyki i Inform Subject supervisor Teachers Lesson type Number of study hours E-learning hours inclu Address on the e-lear Learning activity Number of study hours The interactions betw discussed. Biological macroscopic sytems. discussed Biological macroscopic sytems. discoveries in the scc physics, and related fi science and technoloc [K7_W02] Has enhar theoretically-founded knowledge of selecte physics, and sufficier of related fields of sci technology. Radiation interactions Fragmentation. Jabtop Clinical phototherapie Introduction to spectro Subject passing Written assessment Seminar Basic literature	Photophysics of biological systems, Technical Physics February 2023 second-cycle studies Full-time studies 2 3 general academic profile Instytut Fizyki i Informatyki Stosowar Subject supervisor Teachers Lesson type Lecture Number of study hours E-learning hours included: 0.0 Address on the e-learning platform: Learning activity Participation in classes includ plan Number of study hours The interactions between emectrom. discussed. Biological systems will be macroscopic sytems. Phenomena of discussion of photochemistry in bios Course outcome [K7_W03] Has general knowledge of current development paths and discoveries in the scope of physics and related fields of science and technology. [K7_W02] Has enhanced, theoretically-founded, detailed knowledge of selected field of physics, and sufficient knowledge of related fields of science or technology. Radiation interactions with matter. E Fragmentation. Jabloński's diagram. Femtosecond photophysics. Free ra Clinical phototherapies. Introduction to spectroscopy. Subject passing criteria Written assessment Seminar Basic literature Supplementary literature	Photophysics of biological systems, PG_00046105 Technical Physics February 2023 Academic y realisation of second-cycle studies Subject growth Full-time studies Mode of deeender deeender of deeender deeender of deeender of deeender of deeende	Photophysics of biological systems, PG_00046105 Technical Physics February 2023 Academic year of realisation of subject second-cycle studies Subject group Full-time studies Mode of delivery 2 Language of instruction 3 ECTS credits general academic profile Assessment form Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Phys Subject supervisor dr in2. Marcin Dampc Teachers dr in2. Marcin Dampc Lesson type Lecture Tutorial Laboratory Number of study 0.0 hours 15.0 0.0 Address on the e-learning platform: https://enauczanie.pg.edu.pl/ Address on the e-learning platform: https://enauczanie.gg.edu.pl/ Learning activity Participation in didactic consultation from study plan 1.0 Number of study 15 1.0	Photophysics of biological systems, PG_00046105 Technical Physics February 2023 Academic year of realisation of subject second-cycle studies Subject group Full-time studies Mode of delivery 2 Language of instruction 3 ECTS credits general academic profile Assessment form Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Subject supervisor dr in2. Marcin Dampc Teachers dr in2. Marcin Dampc Lesson type Lecture Tutorial Laboratory Projec Number of study 15.0 0.0 0.0 0.0 Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/ Learning activity Participation in consultation hours Number of study 15 1.0 1.0 Kr_W03] Has general knowledge Gan select the appropriate expression widiscussion of photochemistry in biosystems. Fully understand excitation processes in molecules and atoms.	Photophysics of biological systems, PG_00046105 Technical Physics February 2023 Academic year of realisation of subject second-cycle studies Subject group Optior Subject group Optior Full-time studies Mode of delivery at the 2 Language of instruction Polish 3 ECTS credits 1.0 general academic profile Assessment form assess Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mather Subject supervisor dr in2. Marcin Dampc Teachers dr in2. Marcin Dampc Eeson type Lecture Tutorial Laboratory Project Number of study 15.0 0.0 0.0 0.0 Eesning hours included: 0.0 Address on the e-learning platform: https://enauczanie.ge.gedu.pl/moodle/course/ Learning activity Participation in consultation hours Self-st Number of study 15 1.0 9.0 9.0 Number of study 15 1.0 9.0 9.0 Number of study 15 1.0 9.0 10 10 Kourent development paths and d	Photophysics of biological systems, PG_00046105 Technical Physics February 2023 Academic year of realisation of subject Second-cycle studies Subject group Cplotal subject Cplotal subject group Cplotal subject Cplotal s	

	eResources addresses	Adresy na platformie eNauczanie: Fotofizyka układów biologicznych (2024) - Moodle ID: 22485 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22485		
Example issues/ example questions/ tasks being completed	1. Selection rules for optical transitions.			
	 Present and discuss one expamle of bioluminescence Present and discuss one example of photoisomerisation process with practical application in medicine. 			
Work placement	Not applicable			