

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Elements of modern physics, PG_00060477									
Field of study	Mechatronics									
Date of commencement of studies			Academic year of realisation of subject			2026/2027				
Education level			Subject group			Obligatory subject group in the field of study				
Mode of study	Full-time studies		Mode of delivery			at the university				
Year of study	2		Language of instruction			Polish				
Semester of study	4		ECTS credits			9.0	9.0			
Learning profile	general academic profile		Assessment form			exam	exam			
Conducting unit	Division Of Automation And Marine Energy -> Institute Of Naval Architecture -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej						echanical			
Name and surname	Subject supervisor			ałgorzata Śmia	ałek-Tel	ega				
of lecturer (lecturers)	Teachers									
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM		
of instruction	Number of study hours	45.0	15.0	15.0	0.0		0.0	75		
	E-learning hours included: 0.0									
Learning activity and number of study hours	Learning activity Participation ir classes includ plan				Self-study SUM					
	Number of study hours	75		39.0		111.0		225		
Subject objectives	N/A									
Learning outcomes	Course outcome		Subject outcome			Method of verification				
	[K6_U01] is able to acquire information from literature, databases and other, properly chosen sources, integrate these information, interpret them, draw conclusions and formulate opinions		The student understands the importance of non-technical aspects and consequences of engineering activities, including their impact on the environment.			[SU3] Assessment of ability to use knowledge gained from the subject				
	[K6_U03] has self-learning skills		The student understands the importance of non-technical aspects and effects of engineering activities, including its impact on the environment.			[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment				
	solid state physics, including the		The student has systematic knowledge of modern physics: vibrations, mechanical waves, RLC circuits, electromagnetic waves, optics, matter waves, elements of atomic physics and nuclear energy, basics of quantum physics			[SW1] Assessment of factual knowledge				

2. RLC 4 3. Electr 4. Optic 5. Optic 6. Elemin 7. Elemin 8. Elemin 7. Elemin 8. Elemin 7. Elemin 8. Elemin 7. Elemin 8. Elemin 8. Elemin 7. Elemin 8. Elemin 8. Elemin 8. Elemin 8. Elemin 8. Elemin 9. Optic 1. Know 3. Simpl 4. Learn 1. Know 3. Simpl 4. Learn Assessment methods Sut and criteria Sut Assessment methods Sut Basic literi Suppleme Example issues/ Example issues/ example questions/ 1. List the			1						
1. Vibra 2. RLC 6 3. Electric 4. Optic 5. Optic 6. Elemin 7. Elemin 8. Elemin 2. Mech 3. REC 0 4. electric 5. Optic Laborator 1. Know 3. Simpli 4. Learn Prerequisites Assessment methods Sut and criteria Sut Recommended reading Basic liter Suppleme Suppleme example issues/ 1. List the tasks being completed 1. List the									
1. Vibra 2. RLC 6 3. Electric 4. Optic 5. Optic 6. Elemin 7. Elemin 8. Elemin 2. Mech 3. REC 0 4. electric 5. Optic Laborator 1. Know 3. Simpli 4. Learn Prerequisites Assessment methods Sut and criteria Sut Recommended reading Basic liter Suppleme Suppleme example issues/ 1. List the tasks being completed 1. List the									
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2. RLC 4 3. Electr 4. Optic 5. Optic 6. Elemin 7. Elemin 8. Elemin 7. Elemin 8. Elemin 7. Elemin 8. Elemin 9. Optic 1. Know 3. Simpl 4. Learn Prerequisites Fundamer and co-requisites Fundamer Assessment methods Sut and criteria Sut Recommended reading Basic liter Supplement Example issues/ example questions/ 1. List the tasks being completed 1. List the									
3. Electi 4. Optic 5. Optic 6. Elemi 8. Elemi 9. Mech 9. Mech 1. Know 2. Know 3. Simpl 4. Learni Prerequisites Assessment methods and criteria Basic literi Problemis Recommended reading Basic literi Suppleme example questions/ tasks being completed	 Vibrations and mechanical waves RLC circuits 								
5. Optic 6. Elema 7. Elema 8. Elema 2. Mech 3. RLC a 4. electr 5. Optic 2. Mech 3. RLC a 4. electr 5. Optic Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites and co-requisites Assessment methods and criteria Recommended reading Basic liter Suppleme Example issues/ example questions/ tasks being completed	3. Electromagnetic waves								
6. Elema 7. Elema 8. Elema 8. Elema 2. Mech 3. RLC of 4. electr 5. Optic Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites and co-requisites Assessment methods and criteria Supplement Recommended reading Basic liter Supplement Example issues/ example questions/ tasks being completed 1. List the them?	 Optics in wave terms Optics from a corpuscular perspective 								
8. Elema Exercises 1. Vibra 2. Mech 3. RLC 0 4. electr 5. Optic: Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites and co-requisites Assessment methods and criteria Recommended reading Basic liter Suppleme Suppleme eResource Example issues/ tasks being completed	6. Elements of condensed phase physics								
1. Vibral 2. Mech 3. RLC (4. electr 5. Optic: Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites Assessment methods Subrator Laborator Laborator Lecture Problems Recommended reading Basic liter Suppleme Suppleme eResource Example issues/ example questions/ tasks being completed	 Elements of atomic physics Elements of physics and nuclear energy 								
2. Mech 3. RLC (4. electr 5. Optic Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites Assessment methods and criteria Recommended reading Basic liter Suppleme Example issues/ example questions/ tasks being completed	Exercises:								
2. Mech 3. RLC (4. electr 5. Optic Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites Assessment methods and criteria Recommended reading Basic liter Suppleme Suppleme Example issues/ example questions/ tasks being completed	1. Vibrations								
4. electr 5. Optic: Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites Assessment methods and criteria Recommended reading Basic liter Supplement Example issues/ example questions/ tasks being completed	Vibrations Mechanical waves RLC circuits electromagnetic waves								
5. Optic Laborator 1. Know 2. Know 3. Simpl 4. Learn Prerequisites Assessment methods and criteria Recommended reading Basic liter Supplement Example issues/ example questions/ tasks being completed									
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3. Simple 4. Learn 4. Learn 4. Learn Assessment methods and criteria Recommended reading Basic liter Suppleme eResource example issues/ example questions/ tasks being completed									
4. Learn Prerequisites Fundamer and co-requisites Sut Assessment methods Sut and criteria Sut Recommended reading Basic liter Suppleme Suppleme eResource eResource tasks being completed 1. List the them?	 Knowledge of the principles of operation and the ability to connect a system containing a simple sensor Simple assembly of an electronic system that performs a given action 								
and co-requisites programm Assessment methods and criteria Sut Laborator Lecture Problems Recommended reading Basic liter Suppleme Suppleme Example issues/ example questions/ tasks being completed 1. List the them?	 Simple assembly of an electronic system that performs a given action Learning to program Arduino and other programs necessary for data visualization 								
and co-requisites programm Assessment methods and criteria Sut Laborator Lecture Problems Recommended reading Basic liter Suppleme Suppleme Example issues/ example questions/ tasks being completed 1. List the them?									
and co-requisites programm Assessment methods and criteria Sut Laborator Lecture Problems Recommended reading Basic liter Suppleme Suppleme Example issues/ example questions/ tasks being completed 1. List the them?									
and co-requisites programm Assessment methods and criteria Sut Laborator Lecture Problems Recommended reading Basic liter Suppleme Suppleme Example issues/ example questions/ tasks being completed 1. List the them?	Fundamentals of differential calculus and geometry. Fundamentals of classical mechanics. Basic skills in								
and criteria Laborator Lecture Problems Recommended reading Basic liter Suppleme Example issues/ example questions/ tasks being completed 1. List the them?	programming								
Example issues/ example questions/ tasks being completed 1. List the them?	ect passing criteria	Passing threshold	Percentage of the final grade						
Problems Recommended reading Basic liter Suppleme Suppleme eResource eResource tasks being completed 1. List the them?	1	50.0%	30.0%						
Recommended reading Basic liter. Supplemended Supplemended Example issues/ example questions/ tasks being completed 1. List the them?		50.0%	40.0%						
Example issues/ example questions/ tasks being completed		50.0%	30.0%						
eResource Example issues/ example questions/ tasks being completed	ture	David Halliday, Robert Resnick, Jearl Walker, Podstawy fizyki. T. 1-5, Wydawnictwo Naukowe PWN, 2012							
eResource Example issues/ example questions/ tasks being completed		J. Orear, Fizyka, tom 1 i 2, Warszawa 1998							
eResource Example issues/ example questions/ tasks being completed		A. Januszajtis, Fizyka dla Politechnik, tom 1-3, Warszawa 1991 J. Massalski, M. Massalska, Fizyka dla Inżynierów, tom 1 i 2,							
eResource Example issues/ example questions/ tasks being completed		Warszawa 2013							
Example issues/ example questions/ tasks being completed	tary literature	https://openstax.org/details/books/u	niversity-physics-volume-1						
Example issues/ example questions/ tasks being completed									
Example issues/ example questions/ tasks being completed									
Example issues/ example questions/ tasks being completed		https://openstax.org/details/books/u	niversity-physics-volume-2						
Example issues/ example questions/ tasks being completed		https://openstax.org/details/books/university-physics-volume-3							
Example issues/ example questions/ tasks being completed									
example questions/ tasks being completed	s addresses	Adresy na platformie eNauczanie:							
example questions/ tasks being completed	1. List the properties of metals, inssulators and semiconductors; what are the main diferencies between								
2. Describ									
2. Describ									
		2. Describe p-n junction							
	p-n junction	2. Characterias a mulayes, what differe them from machanical anas?							
3. Charac		3. Unaracterise e-m waves, what differs them from mechanical ones?							
4. What a	erise e-m waves, what dif	4. What are the main features of laser light?							
5. How do	erise e-m waves, what dif								
Work placement Not applic	erise e-m waves, what dif e the main features of las	-							
4. What a	e p-n junction	3. Characterise e-m waves, what differs them from mechanical ones?4. What are the main features of laser light?5. How does the nuclear reactor works?							

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