

## 。 GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

Field of study         Materials Engineering           Date of commencement of studies         October 2024         Academic year of realisation of subject         2025/2026           Education level         second-cycle studies         Subject group         Specially subject group           Mode of study         Full-time studies         Mode of delivery         at the university           Year of study         2         Language of instruction         Polish nore           Semester of study         3         ECTS credits         2.0           Conducting unit         Division Of commes -s healthot Onarotochrodoxy Ard Materials Engineering -> Faculty Of Applied           Name and sumame of locturer (lecturers)         Teachers         dr inz. Tradeusz Miruszewski           Learning activity and number of study         Learning in tinuteet:         0.0         0.0         0.0         0.0         0.0           Subject bolycettives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         Subject subject subject and the subject and thermoelectric materials.           Learning outcomes         Corrace cultorine         Subject cultorine         Subject cultorine         Subject subject           Learning activity and number of study hours         Learning activity (15         2.0         33.0         50     <	Subject name and code	, PG_00065849								
Date of commencement of studies         October 2024         Academic year of realisation of subject         2025/2026           Education level         second-cycle studies         Subject group         Subject group         Subject group           Mode of study         Full-time studies         Mode of delivery         at the university           Year of study         2         Language of instruction         Academic year           Semester of study         3         ECTS credits         2.0           Learning profile         general academic profile         Assessment form         exam           Conducting unit         Division Of Coramics Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Mathematics -> Wydrais Politechnic (Cadaskie)         Subject Supervisor           Teachers         dr in: Tradeusz Miruszewski         Esson type         Subject Supervisor         Subject Supervisor           Eleasing boris included: 0.0         Learning activity hours         Eleasin type         Tutorial         Laboratory         Project         Suring           Subject objectives         Acquiring Knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         [WT] Assessment of factual functional solving problems           Subject contents         1. Introduction to the subject, introductory information, historical energy.										
Conjust group         Conjust group         Subject group related is subjective           Mode of study         Full-time studies         Mode of delivery         at the university           Year of study         2         Language of instruction         Polish none           Semester of study         3         ECTS credits         2.0           Conducting unit         Division Of Ceramics >- Institute Of Nanotechnology And Materials Engineering >- Faculty Of Applied Physics And Mathematics >- Wydziay Politicchnik Gdanskiej         Subject supervisor           Canducting unit         Division Of Ceramics >- Institute Of Nanotechnology And Materials Engineering >- Faculty Of Applied Physics And Mathematics >- Wydziay Politicchnik Gdanskiej         Subject supervisor           Leason types and methods         Lesson type         Lecture         Tubrial         Laboratory         Project         Seminar         SUM           Learning activity and number of study hours         Learning incuded 0.0         0.0         0.0         0.0         15           Subject upper of sudy hours         Course outcome         Subject upper of the phenomena, technologies and applications of thermoelectric materials.           Learning outcomes         Course outcome         Subject outcome         Subject outcome         SWM Assessment of factual knowledge of the fields of science instruction in mathematics, physics, chemita is notecelegrarding and enhanced knowledge of segreging	Date of commencement of						2025/	2025/2026		
Name         Consultation         Polish none           Semester of study         2         Language of instruction         Polish none           Semester of study         3         ECTS credits         2.0           Learning profile         general academic profile         Assessment form         exam           Conducting unit         Division Of Ceramics > Institute Of Nanctechnology And Materials Engineering > Faculty Of Applied Physics And Mathematics - Vydday Policichmic Gdardskie         Faculty Of Applied           Name and summe of lecturer (lecturers)         Eason type         Leture         Tutorial         Laboratory         Project         Seminar         SUM           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Lesson types and methods         Learning activity         Participation in didactic classes included in study         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         Method of verification (RT, W03) Has extended and enhanced knowledge of materials and their sources of electrical energy.         SW/J Assessment of factual knowledge of the fields of science sources of electrical energy.         SW/J Assessment of factual knowledge of	Education level	second-cycle studies		Subject gro				Subject group related to scientific		
Subject contents         none           Semester of study         3         ECTS credits         2.0           Learning profile         general academic profile         Assessment form         exam           Conducting unit         Division Of Ceramics > Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Mathematics >> Wydzia'y Politechnikiej         Subject supervisor         dr in2. Tadeusz Miruszewski           Name and sumame of lecturer (lecturers)         Teachers         dr in2. Tadeusz Miruszewski         Submet supervisor           Lesson type and methods         Lesson type Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Number of study hours         Learning hours included: 0.0         Learning activity         Participation in didactic classes included in study         Participation in consultation hours         Self-study         SUM           Number of study hours         15         2.0         33.0         50           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         SWJ Assessment of factual           Learning outcomes         Course outcome         Subject outcome         Subject outcome         Method of verification to use in the design of efficient sortaned in written work and importance (from woring in mathematics, physics, chemistry and other fields, useful w	Mode of study	Full-time studies		Mode of delivery			at the	at the university		
Learning profile         general academic profile         Assessment form         exam           Conducting unit         Division Of Caramics -> Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Matternatics -> Wydzia/P Polietchiki Gdańskie         Image: Conducting Caramics -> Wydzia/P Polietchiki Gdańskie           Name and sumame of lecturer (lecturers)         Subject supervisor         dr in2. Tadeusz Miruszewski           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Learning activity and number of study hours         Learning activity         Participation in didactic classes included in study         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Mumber of study hours         Subject outcome         Method of verification           KT, W031 Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.         Students understand there ad low of extinction work and projects         SW11 Assessment of factual knowledge of the fields of science and scientific disciplines relevant to materials engineering, and knowledge reactive working a diverking problems, within the scope of the fields of science and scientific disciplines relevant to materials engineering, and knowledge sciencintit	Year of study			Language	-					
Conducting unit         Division Of Ceramics -> Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechnik (Gańskie)           Name and surname of lecturer (lecturers)         Subject supervisor         dr. in2. Tadeusz Miruszewski           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Number of study hours         Learning activity and number of study hours         Earring activity         Participation in didactic classes included in study         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         Method of verification           [K7, W03] Has extended and entimera docuring in mathematics, physics, chemistry and other fields, useful when use the design of electical energy.         With Assessment of factual knowledge of the fields of science and scientific discipliners relevant to materials engineering, and their historical development and entraneed of inmarity.         Students understand the need to update knowledge of electrical energy.         [SW1] Assessment of factual knowledge         Students understand the need to update knowledge o	Semester of study	3		ECTS cred	ECTS credits					
Physics And Mathematics -> Wydziały Politechniki (Gadraškiej           Name and surmame of lecturer (lecturers)         Subject supervisor         dr in 2. Tadeusz Miruszewski           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Learning activity and number of study hours         Learning activity plan         Participation in didactic plan         Consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Mumber of study         16         2.0         33.0         50           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials solence.         Keithod of verification         Keithod of verification         Keithod of verification           K7_W031 Has extended and erbanced knowledge of materials solence.         Students understand the need to innovtance of the fields of science and scientific disciplines relevant its order to design new souces of electrical energy.         (SW1) Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory inf	Learning profile	general academic pro	ofile	Assessmer	nt form		exam			
Control of the clurrer (lecturers)         Teachers         dr inz. Tadeusz Miruszewski           Lesson types and methods of instruction         Lesson type         Lecture         Tutorial         Laboratory         Project         Seminar         SUM           Learning activity and number of study hours         Learning hours included: 0.0         0.0         0.0         0.0         0.0         15           Subject objectives         Learning hours included: 0.0         Participation in didactic classes included in study plan         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject objectives         Acquiring Nowledge about the phenomena, technologies and applications of thermoelectric materials.           Learning outcomes         Course outcome         Subject outcome         [W3] Assessment of knowledge contained in written work and projects           If X_W01] Has extended and mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.         Students understand the need to knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and evolution of humanity.         Students understand the need to knowledge         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introduc	Conducting unit	Physics And Mathem	-> Institute Of atics -> Wydzia	Nanotechnology And Materials Engineering -> Faculty Of Applied ły Politechniki Gdańskiej						
Lesson types and methods of instruction         Lesson type hours         Lecture Leture Number of study hours         Tutorial 15.0         Laboratory 0.0         Project 0.0         Sum 0.0         SUM           Learning activity and number of study hours         Learning activity pan         Learning activity pan         Participation in didactic classes included in study plan         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         Method of verification           Learning outcomes         Course outcome         Subject outcome         Method of verification           KT_W03] Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, usedi when ormulating and solving problems within the scope of materials science.         Students understand the need to insortical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introductor to the subject, introductors, information, historical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductors, information, historical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductors, information, historical outline.         2. Electrical transport in metals and selectronic and scientific as engineering, and their insortical develop				dr inż. Tadeusz Miruszewski						
of instruction         Number of study hours         15.0         0.0         0.0         0.0         0.0         0.0         15           Learning activity and number of study hours         Learning hours included: 0.0         Elearning hours included: 0.0         Subject objectives         Subject objectives         Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject objectives         Acquiring knowledge of enhanced knowledge of enhances (knowledge of enhance knowledge of enhance and solving problems within the scope of merains science.         Subject outcome         Kethod of verification (SW1] Assessment of factual knowledge         [SW1] Assessment of factual knowledge           Viewedge of the fields of science and science         Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Asseescription B. Thomson effect microscoptic description B.	of lecturer (lecturers)	leachers	dr inż. Tadeu	dr inż. Tadeusz Miruszewski						
of instruction         Number of study E-learning hours included: 0.0         0.0         0.0         0.0         0.0         0.0         15           Learning activity and number of study hours         Learning activity Participation in didactic classes included in study plan         Participation in consultation hours         Setf-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Subject outcome         Method of verification phenomena occurring in thermoelectric materials and their sources of technical energy.         ISW3 Assessment of forwoledge projects         ISW1 Assessment of factual knowledge of the fields, useful when formulating and solving problems within the scope of materials socience.         ISW1 Assessment of factual knowledge of the fields of science and science stead projects         ISW1 Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         ISW1 Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         ISW1 Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         ISW1 Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         ISW1 Assessment of factual knowledge <td< td=""><td>Lesson types and methods</td><td>Lesson type</td><td>Lecture</td><td>Tutorial</td><td>Laboratory</td><td>Projec</td><td>t</td><td>Seminar</td><td>SUM</td></td<>	Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
Learning activity and number of study hours         Learning activity plan         Participation in didactic classes included in study plan         Participation in consultation hours         Self-study         SUM           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         50           Learning outcomes         Course outcome         Subject outcome         Method of verification           IKT_W03] Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems science.         Expanding knowledge of physical phenomena occurring in thermoelectric materials and their use in the design of efficient sources of electrical energy.         [SW1] Assessment of factual knowledge           Subject contents         [K7_W01] Has extended knowledge of the fields of science, and scientific disciplines relevant to materials engineering, and their historical development and evolution of humanity.         Students understand the need to update knowledge regarding materials in order to design new sources of electrical energy.         [SW1] Assessment of factual knowledge           Subject contents         1         Introduction to the subject, introductory information, historical outline.         [SU2] Exercisites and design of specific heat, phonon and electronic thermal conductivity 7. Design of thermoelectric materials metals, group IV elements, group V and VI elements, phonon glasses, TAGS group, oxides 9. Application of thermoelectric materials introductory information, the concept of thermoelectric Figure of Merit ZT, efficiency n		hours		0.0	0.0	0.0		0.0	15	
and number of study hours         classes included in study plan         consultation hours           Number of study hours         15         2.0         33.0         50           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.         Expanding knowledge of physical enhanced knowledge of enhanced knowledge of enhanced knowledge of enhanced knowledge of materials         Subject outcome         Method of verification           [K7_W03] Has extended and enhanced knowledge of materials science.         Expanding knowledge of physical phenomena occurring in thermoelectric materials and their use in the design of efficient sources of electrical energy.         [W3] Assessment of knowledge contained in written work and prevent and other fields, useful when formulating and solving problems within the scope of materials science.         [Kr2_W01] Has extended knowledge of the fields of science and scientific displines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and evolution of humanity.         Students understand the need to wources of electrical energy.         [SW1] Assessment of factual knowledge           1         Introduction to the subject, introductory information, historical outline.         Electrical transport in metals and semiconductors.         Seebeck effect microscopic description           4         I. Introduction to the subject, introductory information, historical outline.         Teleficiency n.         Teleficiency n.           5										
Nours         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.           Subject objectives         Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.           Learning outcomes         Course outcome         Subject outcome         Method of verification           IK7_W03] Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.         Expanding knowledge of physical phenomena occurring in use in the design of efficient sources of electrical energy.         [SW1] Assessment of factual knowledge           [K7_W01] Has extended knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and evolution of humanity.         Students understand the need to sources of electrical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of security materials in order to design new sources of electrical energy.           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge of the world and evolution of humanity.           Subject contents         1. Introduction to the subject outcore (exact and nature description 6. Models of specific heat, phonon and electronic thermal conductivity 7. Design of therm		Learning activity	classes includ				Self-study		SUM	
Learning outcomes         Course outcome         Subject outcome         Method of verification           ILearning outcomes         [K7_W03] Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.         Expanding knowledge of physical phenomena occurring in the design of efficient sources of electrical energy.         [SW3] Assessment of knowledge contained in written work and projects           [K7_W01] Has extended knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and evolution of humanity.         Students understand the need to update knowledge regarding materials in order to design news         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           3. Seebeck effect microscopic description         5. Thomson effect microscopic description         [Sw1] Assessment of factual knowledge           4. Pettier effect microscopic description         6. Models of specific heat, phonon and electronic thermal conductivity         [Sw1] Assess, TACS group, oxides           9. Application of thermoelectric materials metals, group IV elements, group V and VI elements, phonon glasses, TACS group, oxides         [Sw1] Assessment on glasses, TACS group, oxides           9. Application of thermoelectric materials thermoelectric modules, space engineering, nano		· · · · ·	15		2.0		33.0		50	
Subject contents         1. Introduction to the subject, introductory information, historical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW2] Assesseston to description <td< td=""><td>Subject objectives</td><td colspan="7">Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.</td></td<>	Subject objectives	Acquiring knowledge about the phenomena, technologies and applications of thermoelectric materials.								
enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.         phenomena occurring in formulating beromena occurring in formulating and solving problems surves of electric materials and their sources of electrical energy.         contained in written work and projects           [K7_W01] Has extended knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and evolution of humanity.         Students understand the need to update knowledge regarding materials in order to design new sources of electrical energy.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject contents         1. Introduction to the subject, introductory information, historical outline.         [SW1] Assessment of factual knowledge           Subject passing of the fields grade         Subject passing criteria	Learning outcomes	Course out	come	Subj	ect outcome			Method of ve	rification	
knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and evolution of humanity.update knowledge regarding materials in order to design new sources of electrical energy.knowledgeSubject contents1. Introduction to the subject, introductory information, historical outline. 2. Electrical transport in metals and semiconductors. 3. Seebeck effect microscopic description 6. Models of specific heat, phonon and electronic thermal conductivity 7. Design of thermoelectric materials introductory information, the concept of thermoelectric Figure of Merit ZT, efficiency η 8. Types of thermoelectric materials metals, group IV elements, group V and VI elements, phonon glasses, TAGS group, oxides 9. Application of thermoelectric materials thermoelectric modules, space engineering, nanotechnology and thermoelectricityPrerequisites and co-requisitesKnowledge of solid state physics and electronics, and physical chemistry.Assessment methodsSubject passing criteria		enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials		phenomena occurring in thermoelectric materials and their use in the design of efficient			contained in written work and projects [SW1] Assessment of factual			
<ul> <li>2. Electrical transport in metals and semiconductors.</li> <li>3. Seebeck effect microscopic description</li> <li>4. Peltier effect microscopic description</li> <li>5. Thomson effect microscopic description</li> <li>6. Models of specific heat, phonon and electronic thermal conductivity</li> <li>7. Design of thermoelectric materials introductory information, the concept of thermoelectric Figure of Merit ZT, efficiency η</li> <li>8. Types of thermoelectric materials metals, group IV elements, group V and VI elements, phonon glasses, TAGS group, oxides</li> <li>9. Application of thermoelectric materials thermoelectric modules, space engineering, nanotechnology and thermoelectricity</li> <li>Prerequisites</li> <li>Assessment methods</li> <li>Subject passing criteria</li> <li>Passing threshold</li> <li>Percentage of the final grade</li> </ul>		knowledge of the fields of science and scientific disciplines relevant to materials engineering, and their historical development and importance for the progress of exact and natural sciences, knowledge of the world and		update knowledge regarding materials in order to design new						
Prerequisites       Knowledge of solid state physics and electronics, and physical chemistry.         and co-requisites       Assessment methods         Subject passing criteria       Passing threshold         Percentage of the final grade	Subject contents	<ol> <li>Electrical transport in metals and semiconductors.</li> <li>Seebeck effect microscopic description</li> <li>Peltier effect microscopic description</li> <li>Thomson effect microscopic description</li> <li>Models of specific heat, phonon and electronic thermal conductivity</li> <li>Design of thermoelectric materials introductory information, the concept of thermoelectric Figure of Merit ZT, efficiency η</li> <li>Types of thermoelectric materials metals, group IV elements, group V and VI elements, phonon glasses, TAGS group, oxides</li> <li>Application of thermoelectric materials thermoelectric modules, space engineering, nanotechnology and</li> </ol>								
Assessment methods Subject passing criteria Passing threshold Percentage of the final grade										
	· · ·	Subject passin	g criteria	Pass	ing threshold		Per	centage of the	e final grade	
LAIII 30.0%	and criteria	Exam		50.0%			100.0%			

Recommended reading	Basic literature	[1] D.M. Rowe, CRC handbook of Thermoelectrics, CRC Press 1995					
		[2] J. Przyłuski, K. Borkowski, Materiały termoelektryczne, Wyd. PW,					
		1983					
		[3] K. Kurosaki et al. , Thermoelectric materials, Wyd. De Gruyter, 2020					
		[4] F.A. Kulacki, Handbook of Thermal Science and Engineering, Wyd. Springer, 2018					
	Supplementary literature	none					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed	<ul> <li>Give a definition of thermoelectric Figure of Merit and discuss the temperature changes of parameters occurring in ZT;</li> <li>Discuss the Seebeck effect using the example of a Cu-Ni metal junction;</li> <li>Give known methods of producing thermoelectric materials and discuss in more detail one selected method.</li> <li>Discuss the dependence of specific conductivity on temperature for an intrinsic semiconductor.</li> <li>Discuss the principle of operation of a radioisotope thermoelectric generator.</li> </ul>						
Work placement	Not applicable						

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