

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Podstawy inżynierii materiałowej 1**
 Name in English: **Fundamentals of Materials Engineering 1**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable):
 Level and form of studies: **1st level, full-time**
 Kind of subject: **obligatory**
 Subject code: **ELR051201**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30				
Number of hours of total student workload (CNPS):	120				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	4				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	2.80				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Student has adequate knowledge from the range of physics and chemistry, relating to the structure and properties of matter from the range of the elementary and grammar school

SUBJECT OBJECTIVES

- C1. Knowledge of the nature of physical properties of materials for electrical engineering
 C2. Knowledge of the measurements methods of basic properties of materials for electrical engineering
 C3. Pointing the awareness of the responsibility for the own work

SUBJECT LEARNING OUTCOMES*relating to knowledge:*

- PEU_W01 Student has knowledge about the materials, their basic properties and application in electrical engineering
 PEU_W02 Student has knowledge about the measurement methods of basic properties of materials for electrical engineering

*relating to skills:**relating to social competences:*

- PEU_K01 Student has awareness of the responsibility for the own work

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Introduction, presentation of the program. The structure of solid matter	2
Lec 2	The structure of crystal materials	2
Lec 3	Electrical conductivity of metals	2
Lec 4	Alloys and their properties. Heat treatment of materials, properties of materials. Solder alloys. Bimetallic strips	2
Lec 5	Resistive, contact, special and thermoelectric materials	2
Lec 6	Materials corrosion and protection rules	2
Lec 7	The structure of semiconductors. Conductivity of intrinsic and doped semiconductors	2
Lec 8	Test (Lectures 1 - 7). Dielectric materials - properties. Gases, vacuum, liquid	2
Lec 9	An inorganic insulation materials - ceramics, glass, mica materials	2
Lec 10	Polymers. Thermoplastic and thermosetting isolating materials	2
Lec 11	Modification of polymers properties. The polymers in the constructions of electrical equipment	2
Lec 12	Magnetic materials, magnetization curves, energy losses in ferromagnetic materials, classification and applications	2
Lec 13	Investigation of chosen properties of conductive, dielectric and magnetic materials	2
Lec 14	Materials in optoelectronics. Storage devices for data processing	2
Lec 15	Trends in development of materials engineering. Test lecture (8-14)	2
Total hours:		30

TEACHING TOOLS USED
N1. Traditional lecture using multimedia presentation
N2. Student's own work
N3. Consultation

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEU_W01 PEU_W02 PEU_K01	F1 - Test (Lectures 1 - 7)
F2(w)	PEU_W01 PEU_W02 PEU_K01	F2 - Test (Lectures 8 - 14)
P(w)	P=0.5 F1 + 0.5 F2	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] Celiński Z., Materiałoznawstwo elektrotechniczne, Oficyna Wyd. Politechniki Warszawskiej, Warszawa, 2005. [2] Blicharski M., Wstęp do inżynierii materiałowej, Wyd. AGH, Kraków, 2003 [3] Kolbiński K., Słowikowski J., Materiałoznawstwo elektrotechniczne, WNT, 1988 SECONDARY LITERATURE: [1] Podstawy inżynierii materiałowej. Laboratorium. Oficyna Wyd. Politechniki Wrocławskiej 2005.

SUBJECT SUPERVISOR
Ryszard Kacprzyk, ryszard.kacprzyk@pwr.edu.pl