

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Podstawy inżynierii materiałowej 2**
 Name in English: **Fundamentals of Materials Engineering 2**
 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: **ELR051202**
 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): | | | 60 | | |
| Form of crediting: | | | crediting with grade | | |
| For group of courses mark (X) final course: | | | | | |
| Number of ECTS points: | | | 2 | | |
| including number of ECTS points for practical (P) classes : | | | 2 | | |
| including number of ECTS points for direct teacher-student contact (BK) classes: | | | 1.40 | | |

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has a basic knowledge of the physical and chemical phenomena occurring in materials under the influence of exposure electrical, thermal, mechanical
2. Has a basic knowledge of the properties, structure and technology of materials and range of applications in the construction of electrical engineering
3. Has a basic knowledge of conductive materials, semiconductors, dielectrics and magnetics
4. Student properly and effectively applies laws and rules of physics to the qualitative and quantitative analysis of physical phenomenon with engineering character

SUBJECT OBJECTIVES

- C1. Understanding the knowledge necessary to understand the basic electrical properties of materials
 C2. The practice of the skills of applying basic measuring techniques to the investigations of electrotechnical materials properties
 C3. The acquisition of basic practical skills of measuring instruments
 C4. Promoting cooperation in a group and team work

SUBJECT LEARNING OUTCOMES*relating to knowledge:**relating to skills:*

- PEU_U01 Student is able to apply the laws and rules of physics to analysis of the physical phenomenon and to plan and execute the measurements in safe way, and then to elaborate the results of the measurements
 PEU_U02 Student is able to measure properties of the materials used in electrical engineering

relating to social competences:

- PEU_K01 Student has awareness of the responsibility for the own and team work and is ready to submit to work principles to obtain common aim

| PROGRAMME CONTENT | | |
|------------------------------|---|------------------|
| Form of classes - laboratory | | Number of hours: |
| Lab 1 | Introduction: requirements and method of crediting. Presentation of the BHP rules of the lab. The division into groups. | 3 |
| Lab 2 | Investigation of dielectrics resistivity | 3 |
| Lab 3 | Investigation of dielectric permittivity | 3 |
| Lab 4 | Measurements of dielectric loss factor | 3 |
| Lab 5 | Electric strength test | 3 |
| Lab 6 | Investigation of magnetic properties of electrical steels samples | 3 |
| Lab 7 | The study of the mechanical properties of insulating materials | 3 |
| Lab 8 | The study of thermal properties | 3 |
| Lab 9 | Investigation of selected physical and chemical properties of liquid dielectrics | 3 |
| Lab 10 | Correction and supplementing class. Crediting | 3 |
| Total hours: | | 30 |

| TEACHING TOOLS USED |
|---|
| N1. Checking the student's knowledge in the form of short tests and questions N2. Wykonywanie pomiarów z wykorzystaniem aparatury laboratoryjnej N3. Analysis of test results N4. Development of measurement results in a report N5. Consultation |

| EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT | | |
|---|-------------------------------|--|
| Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i> | Educational effect number | Way of evaluating educational effect achievement |
| F1(L) | PEU_U01 PEU_U02 PEU_K01 | Rating of preparation for classes |
| F2(L) | PEU_U01 PEU_U02 PEU_K01 | Crediting of reports from research |
| P(L) | $P=0,5F1+0,5F2$ | |

| PRIMARY AND SECONDARY LITERATURE |
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| PRIMARY LITERATURE: [1] Podstawy inżynierii materiałowej. Laboratorium. Oficyna Wyd. Politechniki Wrocławskiej 2005 |
| SECONDARY 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., Słownikowski J., Materiałoznawstwo elektrotechniczne, WNT, 1988 |

| SUBJECT SUPERVISOR |
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