

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Technika wysokich napięć 1**
 Name in English: **High voltage technology 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: **ELR051101**
 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): | 90 | | | | |
| Form of crediting: | examination | | | | |
| For group of courses mark (X) final course: | | | | | |
| Number of ECTS points: | 3 | | | | |
| including number of ECTS points for practical (P) classes: | | | | | |
| including number of ECTS points for direct teacher-student contact (BK) classes: | 2.10 | | | | |

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

- Has knowledge of the basics of materials engineering.

SUBJECT OBJECTIVES

- C1. Possession of basic knowledge needed for high-voltage insulation design and operation of high voltage power equipment.
 C2. Acquisition of knowledge in the field of safe performance of high voltage test and measurement

SUBJECT LEARNING OUTCOMES*relating to knowledge:*

- PEU_W01 Is able to explain phenomena determining electrical strength of dielectrics
 PEU_W02 Is able to explain phenomena appearing in high voltage systems and knows the measurement methods and evaluation them.

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

- PEU_K01 The ability to think independently, search and analyze information.

PROGRAMME CONTENT

| Form of classes - lecture | | Number of hours: |
|---------------------------|---|------------------|
| Lec 1 | Introduction to the lecture. Basic definitions and notions. | 2 |
| Lec 2 | Voltage exposures of insulation. | 2 |
| Lec 3 | The electric field in the insulating systems | 2 |
| Lec 4 | Mechanisms of electrical discharges in gases. | 2 |
| Lec 5 | Electric strength of air and sulfur hexafluoride | 2 |
| Lec 6 | Surface discharges | 2 |
| Lec 7 | Electric strength of insulating liquids | 2 |
| Lec 8 | Electric strength of solid dielectrics | 2 |
| Lec 9 | High voltage equipment insulation systems. | 2 |
| Lec 10 | Impulse strength, insulation coordination | 2 |
| Lec 11 | Waveforms in transmission lines. | 2 |
| Lec 12 | Surge protection equipment. | 2 |
| Lec 13 | High voltage test circuits | 2 |
| Lec 14 | Measurement of high voltages | 2 |
| Lec 15 | Measurements of dielectric losses and partial discharges. | 2 |
| Total hours: | | 30 |

TEACHING TOOLS USED

N1. Conventional lecture
N2. Individual work

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 - written exam |
| P(w) | P=F1 | |

PRIMARY AND SECONDARY LITERATURE**PRIMARY LITERATURE:**

- [1] Z. Flisowski, Technika Wysokich Napięć, WNT, Warszawa, 1998 i wydania następne
[2] Praca zbiorowa pod red. J. Fleszyńskiego, Laboratorium wysokonapięciowe w dydaktyce i elektroenergetyce, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 1999.
[3] Juchniewicz J., Lisiecki J., Wysokonapięciowe układy izolacyjne, skrypt PWr, 1980

SECONDARY LITERATURE:

- [1] Praca zbiorowa po redakcją Z. Pohla, Napowietrzna izolacja wysokonapięciowa, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2003.
[2] Praca zbiorowa po redakcją H. Mościckiej-Grzesiak, Inżynieria wysokich napięć w elektroenergetyce, Wydawnictwo Politechniki Poznańskiej, t.1 - 1996, t.2 - 1999.
[3] Praca zbiorowa po redakcją R. Kosztaluka, Technika badań wysokonapięciowych, t. 1, WNT, Warszawa, 1985.

SUBJECT SUPERVISOR

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