

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Maszyny elektryczne 3**
 Name in English: **Electrical Machines 3**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable):
 Level and form of studies: **1st level, part-time**
 Kind of subject: **obligatory**
 Subject code: **ELR043164**
 Group of courses: **NO**

| | Lecture | Classes | Laboratory | Project | Seminar |
|--|---------|---------|----------------------|---------|---------|
| Number of hours of organized classes in University (ZZU): | | | 10 | | |
| Number of hours of total student workload (CNPS): | | | 27 | | |
| Form of crediting: | | | crediting with grade | | |
| For group of courses mark (X) final course: | | | | | |
| Number of ECTS points: | | | 1 | | |
| including number of ECTS points for practical (P) classes : | | | 1 | | |
| including number of ECTS points for direct teacher-student contact (BK) classes: | | | 0.70 | | |

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Students know principles during electrical energy transformation and phenomena in synchronous machines, their parameters, properties and characteristics.
2. Student has knowledge about construction and phenomena in DC machines.
3. Student has knowledge about parameters, properties and characteristics of DC machines.
4. Student is able to explain phenomena, parameters and properties of synchronous machines.
5. Student is able to explain principles, phenomena, properties and characteristics of DC machines.
6. Student is able to measure and analyze characteristics and parameters of transformers and induction machines.
7. Student is able to work with electrical circuits safely, register electrical quantities and make reports.
8. Student is aware of their own responsibility for their work and a willingness to comply with the principles of teamwork.

SUBJECT OBJECTIVES

- C1. Skill to measurement techniques to determine characteristics and parameters of synchronous machines.
 C2. Skill to measurement techniques to determine characteristics and parameters of DC machines.

SUBJECT EDUCATIONAL EFFECTS*relating to knowledge:**relating to skills:*

- PEK_U01 Student is able to measure and analyze characteristics and parameters of synchronous machines.
 PEK_U02 Student is able to measure and analyze characteristics and parameters of DC machines

relating to social competences:

- PEK_K01 Student is able to identify and solve problems of engineering.

PROGRAMME CONTENT

| Form of classes - laboratory | | Number of hours: |
|------------------------------|------------------------------------|------------------|
| Lab 1 | Introduction, safety instructions. | 1 |
| Lab 2 | Synchronous motor. | 2 |
| Lab 3 | DC shunt motor. | 3 |
| Lab 4 | DC series motor | 3 |
| Lab 5 | Grading | 1 |
| Total hours: | | 10 |

TEACHING TOOLS USED

N1. Laboratory with measurement test stands

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

| Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i> | Educational effect number | Way of evaluating educational effect achievement |
|---|--|--|
| F1(L) | PEK_U01 PEK_U02 PEK_K01 | Laboratory preparation |
| F2(L) | PEK_U01 PEK_U02 PEK_K01 | Laboratory activity |
| F3(L) | PEK_U01 PEK_U02 PEK_K01 | Reports |
| P(L) | $P=0,3 \cdot F1 + 0,3 \cdot F2 + 0,4 \cdot F3$ | |

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Plamitzer A., Maszyny elektryczne, WNT, Warszawa 1989
- [2] Latek W.: Zarys maszyn elektrycznych. WNT W-wa 1974 r.
- [3] Antal L., Janta T., Zieliński P.: Maszyny elektryczne. Ćwiczenia laboratoryjne. Of. Wyd. PWr, Wrocław 2001.

SECONDARY LITERATURE:

- [1] Dąbrowski M. Projektowanie maszyn prądu przemienne, WNT Warszawa 1994
- [2] Dąbrowski M. Konstrukcja maszyn elektrycznych, WNT W-wa 1978
- [3] Jezierski E.: Transformatory WNT Wa-wa 1983 r.
- [4] Latek W.: Maszyny elektryczne w pytaniach i odpowiedziach. WNT Wa-wa 1978 r.
- [5] Bajorek Z.: Maszyny elektryczne. WNT 1976 r.

SUBJECT SUPERVISOR

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT **ELR043164 - Electrical Machines 3** AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**

| Subject educational effect | Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable) | Subject objectives | Programme content | Teaching tool number |
|----------------------------|---|--------------------|-------------------|----------------------|
| PEK_U01 | K1ETK_U27 | C.1 | Lab2 | N.1 |
| PEK_U02 | K1ETK_U27 | C.2 | Lab3 Lab4 | N.1 |
| PEK_K01 | K1ETK_K05 | C.1 C.2 | Lab1 Lab5 | N.1 |