

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: **ELR053164**  
 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):			30		
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 LEARNING OUTCOMES***relating to knowledge:**relating to skills:*

- PEU\_U01 Student is able to measure and analyze characteristics and parameters of synchronous machines.  
 PEU\_U02 Student is able to measure and analyze characteristics and parameters of DC machines

*relating to social competences:*

- PEU\_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:		<b>10</b>

**TEACHING TOOLS USED**

N1. Laboratory with measurement test stands

**EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT**

<b>Evaluation</b> <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	<b>Educational effect number</b>	<b>Way of evaluating educational effect achievement</b>
F1(L)	PEU_U01 PEU_U02 PEU_K01	Laboratory preparation
F2(L)	PEU_U01 PEU_U02 PEU_K01	Laboratory activity
F3(L)	PEU_U01 PEU_U02 PEU_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 przemiennego, 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**

Tomasz Zawilak, tomasz.zawilak@pwr.edu.pl