

DESCRIPTION OF THE COURSES

- Course code: **ELR3110**
- Course title: **ELECTRICAL MACHINES I**
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2		1		
<i>Number of hours/semester*</i>	30		15		
<i>Form of the course completion</i>	<i>Written test</i>		<i>Completion of lab. exercises</i>		
<i>ECTS credits</i>	2		1		
<i>Total Student's Workload</i>	60		30		

- Level of the course (basic/advanced):
- Prerequisites: Courses of Mathematics; Physics
Name, first name and degree of the lecturer/supervisor: Jan Zawilak Ph.D., D.Sc.
Ludwik Antal Ph.D., D.Sc., Ignacy Dudzikowski Ph.D., D.Sc., Olgierd Kasaty Ph.D.,
Roman Kramarski Ph.D., Piotr Zieliński Ph.D.,
- Names, first names and degrees of the team's members:
- Year: II Semester: IV
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
- Form of the teaching (traditional/e-learning): traditional
- Course description: Fundamentals of electromechanical energy conversion. Transformers: construction, principle of operation, parameters, operating characteristics, inrush current, 3-ph. transformers, parallel operation. Magnetic fields in electrical machines. Induction machines: construction, principle of operation, equivalent circuit, motoring, generating and braking mode of operation, electromechanical characteristics, starting, speed control. Single-ph. induction motors.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Fundamentals of electromechanical energy conversion.</i>	2
<i>2. Transformers: construction, principle of operation</i>	2
<i>3. Parameters and equivalent circuits of transformers, vector diagrams.</i>	2
<i>4. Operating characteristics, voltage regulation</i>	2
<i>5. 3-ph. transformers, groups of connections, harmonics of currents, voltages and fluxes</i>	2
<i>6. Parallel operation, inrush current, autotransformers</i>	2
<i>7. Magnetic fields in electrical machines</i>	2
<i>8. Windings of AC machines</i>	2
<i>9. Electromotive forces and winding factors</i>	2
<i>10. Harmonics of magnetomotive forces of AC armature windings</i>	2
<i>11. Induction machines: construction, principle of operation, equivalent</i>	

<i>circuit</i>	2
12. <i>Induction machines: electromechanical characteristics motoring, generating and bracing</i>	2
13. <i>Induction machines: starting, speed control</i>	2
14. <i>Induction machines: construction of squirrel cage, parasitic torques</i>	2
15. <i>Single-phase induction motors</i>	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents: Testing of performance and steady-state characteristics of transformers and induction motors.
- Project – the contents:
- Basic literature:
- Latek W.: *Zarys maszyn elektrycznych*. WNT W-wa 1974 r.
- Plamitzer A. M.: *Maszyny elektryczne*. WNT W-wa 1976 r.
- Dąbrowski M.: *Projektowanie maszyn elektr. prądu przemiennego* WNT W-wa 1994 r.
- Jezierski E.: *Transformatory* WNT Wa-wa 1983 r.
- Bajorek Z.: *Maszyny elektryczne*. WNT 1976 r.
- Antal L., Janta T., Zieliński P.: *Maszyny elektryczne. Ćwiczenia laboratoryjne*. Of. Wyd. PWr, Wrocław 2001.
- Additional literature:
- Latek W.: *Maszyny elektryczne w pytaniach i odpowiedziach*. WNT Wa-wa 1978 r.
- Conditions of the course acceptance/creditation:

Passing of a written test and completion of 4 lab exercises.

* - depending on a system of studies