

## DESCRIPTION OF THE COURSES

- Course code: **ELR3104**
- Course title: Electrical machines – selected problems
- 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>	<b>1</b>				
<i>Number of hours/semester*</i>	<b>15</b>				
<i>Form of the course completion</i>	<i>Written test</i>				
<b>ECTS credits</b>	<b>1</b>				
<b>Total Student's Workload</b>	<b>30</b>				

- Level of the course (basic/advanced):
- Prerequisites: Courses of Electric machines part I and II
- Name, first name and degree of the lecturer/supervisor:  
Ignacy Dudzikowski Ph.D., D.Sc. Prof., Jan Zawilak Ph.D., D.Sc. Prof..
- Names, first names and degrees of the team's members:  
Marek Ciurys M.Sc Eng., Dariusz Gierak M.Sc. Eng., Tomasz Zawilak M.Sc. Eng.
- Year: I Semester: I
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course): Application of permanent magnets in electrical machines. Multispeed alternating current machines with switchable windings and variable magnetic pole pairs number.
- Form of the teaching (traditional/e-learning): traditional
- Course description: Application of permanent magnets in electrical machines. Brushless, reluctance and stepping motors. Electromagnetic phenomena in the motors supplied by converters. Multispeed alternating current machines with switchable windings and variable magnetic pole pairs number: construction basics, parameters and steady-state characteristics, applications. Thyristor voltage regulator-fed AC motors.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Structures and properties of the permanent magnet machines:</i>	<i>2</i>
<i>Synchronous Brushless and commutator dc motors</i>	<i>2</i>
<i>2. Reluctance and stepping motors</i>	<i>1</i>
<i>3. Asynchronous motors synchronized by the reluctance torque</i>	<i>1</i>
<i>4. Motors supplied by converters</i>	<i>1</i>
<i>5. AC motors speed regulation</i>	<i>1</i>
<i>6. Switchable windings with changeable magnetic pole pairs number and pole-amplitude modulation</i>	<i>1</i>
<i>7. Switchable rotor windings with changeable magnetic pole pairs number</i>	<i>1</i>

8. <i>Basic parameters and steady-state characteristics of multispeed synchronous motors with electromagnetic and permanent magnet excitation</i>	2
9. <i>Parameters and steady-state characteristics of thyristor voltage regulator-fed AC motors</i>	1
10. <i>Construction specificity of 6 and 12 pulse converter-fed motors</i>	1
11. <i>Pass</i>	1

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
- Basic literature:
  1. Dąbrowski M., *Projektowanie maszyn elektrycznych prądu przemiennego*, WNT, Warszawa 1994
  2. Glinka T., *Maszyny elektryczne o magnesach trwałych* Wyd. Pol. Śląskiej Gliwice 2002 r.
  3. Sochocki R., *Mikromaszyny elektryczne*, Wyd. Pol. Warszawskiej, 1996 r.
- Additional literature:
  1. Dudzikowski I., *Silniki komutatorowe o magnesach trwałych*, Wydawnictwo Politechniki Wrocławskiej 1992 r
  2. Zawilak J.- *Uzwojenia przelączalne maszyn elektrycznych prądu przemiennego* Wydaw. Politechniki Wrocławskiej 1986 r.
- Conditions of the course acceptance/creditation:
  - Passing of a written test.

\* - depending on a system of studies