STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Foundations of electrical drives**		Code **1010331151010330053**

Field of study **Control Engineering and Robotics**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 5**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**

Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**

No. of hours Lecture: **-** Classes: **-** Laboratory: **1** Project/seminars: **-**	No. of credits **2**

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art **technical sciences**	ECTS distribution (number and %**)** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student should have knowledge in chosen branches of physics including the electricity and the magnetism and the knowledge of the theory of electric circuits.
2	**Skills**	Student is able to obtain information from literature, databases and other sources; has abilities of the self-education for improving qualifications and the update of professional competence.
3	**Social competencies**	Student is aware of a need to expand his competence and readiness to undertake the cooperation in the team; has an awareness of the importance and understands other aspects of engineering activity, including its influence on the environment.

Assumptions and objectives of the course:

Getting knowledge of building, operation and characteristics of the basic drives with converters.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student has a knowledge tidied up in the structure, the application and control of the automation and robotics systems - [K_W19++] - [-]

2. Student knows and understands typical engineering technologies, knows and understands principles of the selection of servo- and measuring-testing devices. - [K_W20++] - [-]

Skills:

1. Student is able to use models of simple electromechanical systems, as well as to use them for analysis and design automations and robotics systems. - [K_U05+++] - [-]

2. Student is able to select the kind and parameters of servo- and measuring system, control unit for the chosen application and to effect their integration in the form of the ultimate measuring-control system. - [K_U17++] - [-]

Social competencies:

1. Student has an awareness of the need for the professional approach towards technical issues, of meticulous acquainting oneself with documentation and environmental conditions, in which devices and their elements can function - [K_K04++] - [-]

Assessment methods of study outcomes

Laboratory exercises are attested on the base of presence at the laboratory, activity during exercising and report after it (one report for exercising group)

Course description

Parameters, characteristics and operation modes of the induction and DC machine, thyristor DC drive, methods of induction motor starting,frequency control of tha induction motor, thermal states of the electrical machine, fun drive.

Basic bibliography:

1. 1. Drozdowski P.: Wprowadzenie do napędów elektrycznych. Skrypt Politechniki Krakowskiej, Kraków 1998.

2. 2. Sidorowicz J. Napęd elektryczny i jego sterowanie. Oficyna Wydawnicza Politechniki Warszawskiej 1994

3. 3. Kaczmarek T.: Napęd elektryczny robotów, wyd.2, Wydawnictwo Politechniki   Poznańskiej, Poznań 1998.

Additional bibliography:

1. 1. Muszyński R., Kaczmarek T.: Sterowanie układami elektromechanicznymi. Przykłady obliczeniowe. Wydawnictwo Politechniki Poznańskiej, Poznań 2007.

2. 2. Tunia H., Kaźmierkowski M.P.: Automatic Control of Converter-fed Drives, Elsevier   Amsterdam ? London ? New York ? Tokyo, PWN Warszawa 1994.

3. 3. Dewan S. B., Slemon G. R., Straughen A.: Power Semiconductor Drives. John Wiley &#38; Sons, New York, Chichester, Brisbane, Toronto, Singapore 1984.

Result of average student's workload	
Activity	**Time (working hours)**
1. Participation in the exercises	15
2. Consultation	2
3. Preparation for exercises	13
4. Preparation of the reports	15

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	45	2
Contact hours	17	2
Practical activities	0	0