STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Electromechanical Devices in Automatics	**1010321371010320071**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**general academic**	**4 / 7**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Electrical Systems in Mechatronics	**Polish**	**obligatory**

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

No. of hours	No. of credits
Lecture: **15** Classes: **-** Laboratory: **30** Project/seminars: **15**	**7**

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

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**7 100%**
Technical sciences	**7 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge of: the theory of the electromagnetic field, electrical engineering and electrodynamics, metrology of electrical and non-electrical physical quantities, knowledge of the structure of energy converters. Basic knowledge of the principles of construction and operation of facilities
2	**Skills**	Ability to use the technical documentation, the ability to independently carry out measurements of electrical quantities, the ability to effectively self-education in a field related to the chosen field of study
3	**Social competencies**	Skills in teamwork and verbal communication, the awareness of the need to broaden their skills and knowledge, a willingness to work together as a team

Assumptions and objectives of the course:

The transfer of knowledge in the field: research and analysis of mechatronic actuators.

Understanding the problems associated with the operation of mechatronic devices. Acquiring knowledge on methods eliminate hazards associated with the operation of electromagnetic propulsion systems with particular emphasis on environmental hazards arising from the use of mechatronics systems.

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

Knowledge:

1. Know the structure of elected electromechanical and electromagnetic transducers cyclic and acyclic energy - [K_W03++ ,K_W10+]
2. Get to know the problems of operation of mechatronic systems and methods for eliminating risks associated with the operation of electromagnetic propulsion systems - [K_W05+ K_W11++]
3. Know the laws in force in the putting into service of mechatronic devices - [K_W07++ K_W18+]

Skills:

1. formulate and solve problems related to the operation and diagnosis of complex systems, electromechanical systems - [K_U03+++ K_U10++]
2. indicate the potential use of new technologies in the construction of electric power converters - [K_U01+++ K_U19+++]

Social competencies:

1. teamwork and aware of the responsibility for joint action - [K_K01 + K_K02 ++]
2. understandable reporting of the results of their own work and teamwork - [K_K02++]

Assessment methods of study outcomes

lecture

? assess the knowledge and skills listed on the completion of a written,

? continuous evaluation for each course (rewarding activity and the quality of speech).

Laboratory:

? test and favoring knowledge necessary for the accomplishment of the problems in the area of ??laboratory tasks,

? continuous evaluation for each course - rewarding gain skills they met the principles and methods, as well as the social skills of working in a team,

? assessment of knowledge and skills related to the implementation of the tasks your practice, the assessment report performed exercise

Get extra points for the activity in the classroom, ie for:

? the effectiveness of the application of the knowledge gained during solving the given problem;

? ability to work within a team practice in the laboratory performing the task;

? subsequent to the improvement of teaching materials;

? developed aesthetic diligence reports.

Course description

Legislation allowing for the operation of power systems (Polish Standard, EU directives). Methods for measuring force, mechanical stress, torque, moment of inertia, speed and slip occurring in the electromechanical and magnetic pickups. To determine the parameters characterizing the electromagnetic field. Heat source in mechatronic drive systems and methods for its removal. Ventilation systems propulsion systems. Sources of acoustic noise and vibration sources. Measurement of vibrations and noise generated by the transducers mechatronics. Electromechanical compatibility issues of the powertrain.

Simulation of selected machines work. Analysis of the electromagnetic field in some electromagnetic devices. Measurement stations to study phenomena in transformers and implementing systems mechatronics

Basic bibliography:

1. AC micro-machinery, Simst J., Clarendon Press, New York, 1994

2. Mikromaszyny elektryczne, Sochocki R., Ofic. Wyd. PW, Warszawa, 1996

3. Silniki krokowe, Wróbel T., WNT, Warszawa, 1993

4. Projektowanie maszyn elektrycznych prądu przemiennego, Dąbrowski M., WNT, Warszawa, 1994

5. Silnik PM BLDC w napędzie elektrycznym analiza, właściwości, modelowanie, Krykowski K. Wydawnictwo Politechniki Śląskiej, Gliwice 2011

6. www.komel.katowice.pl/zeszyty.html

7.

Additional bibliography:

1. Handbook of small electric motors, Yeadon W.H., Yeadon A.W., Mc Graw Hill, 2001

2. www.energoelektronika.pl

Result of average student's workload

Activity	Time (working hours)
1. Participation in lecture classes	15
2. Participation in laboratory activities	30
3. Participation in project activities	15
4. Participation in consultation	27
5. Preparation for laboratory	36
6. Prepare reports on the performed exercises	28
7. Exam Preparation	27
8. Participation in the exam	8

Student's workload

Source of workload	hours	ECTS
Total workload	186	7
Contact hours	95	4
Practical activities	95	4