STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Basic of Electrical Engineering**		Code **1010601231010320912**
Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 3**
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: **1** Classes: **-** Laboratory: **1** Project/seminars: **-**		No. of credits **3**
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 %) **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics concerning electric current, electromagnetic fields and the mathematics
2	**Skills**	Ability to solve basic problems of electrical engineering on the basis of their knowledge and supplementing the information from the indicated sources
3	**Social competencies**	Understanding the need to broaden their skills, willingness to work as a team.

Assumptions and objectives of the course:

Understanding the theoretical and practical problems of electrical engineering and electronics.

Acquiring the ability to analyze selected AC and DC electrical circuits. Understanding the phenomena occurring in selected electrical machiners and principles of operation of these devices, and measuring instruments.

Knowledge of renewable energy sources

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

Knowledge:

1. Has a basic knowledge of electrical engineering and electronics, including; basic concepts and terms used in electrical engineering and electronics, electrical circuits and methods of solving them, power and energy, the structure and principles of operation of electrical machines, their possible applications in drives, renewable energy sources in transportation - [K1A_W18]

2. Has a basic knowledge of metrology in the field of electrical engineering and electronics, including: methods of measuring and characteristics of measuring instruments and their classification, principles of operation, methods of recording and interpreting of results, measurement errors-the influence of external factors and statistical analysis of measurement results - [K1A_W16]

Skills:

1. Is able to obtain information from the literature, internet, databases and other sources in Polish and English. Can integrate the information to interpret and learn from them, create and justify opinions. - [K1A_U01]

2. Is able to use one additional foreign language in everyday verbal communication, can describe in this language related to the field of study, is able to prepare technical documentation of an engineering. - [K1A_U04]

Social competencies:

1. Understand the need and knows the possibilities of lifelong learning, knows the need for acquiring new knowledge for professional development - [K1A_K01]

2. Has a sense of responsibility for one's own work and is willing to comply with the principles of teamwork and taking responsibility for collaborative tasks - [K1A_U04]

Assessment methods of study outcomes

Written exam - to evaluate the knowledge and skills

Extra points as a form of reward for the activity

Laboratory report Continuous assessment - oral and written responses, favoring of increasing skills of using principles and methods

Course description

Basic Issues of electrical engineering. Direct current circuits and methods of solving them, work and power.Sinusoidal alternating current circuits, solving of circuits using complex numbers, phase diagrams, active, reactive and apparent power, voltage and current resonance, 3-phase circuits. Electrical machines: the elements of construction and operation and applications in means of transport. Selected components of electronics. Facilities of applications solar energy in transport.

Measuring instruments and methods of electrical quanities.

Basic bibliography:

1. Praca zbiorowa Elektrotechnika i elektronika dla nieelektryków, Warszawa, WNT
2. Kurdziel R.: Podstawy Elektrotechniki, WNT, wybrane fragmenty
3. Cholewicki T.: Elektrotechnika teoretyczna WNT, Warszawa t.1
4. Jastrzębska G.: Odnawialne źródła energii i pojazdy proekologiczne, Warszawa WNT 2009
5. Jastrzębska G., Nawrowski R.: Zbiór zadań z Podstaw Elektrotechniki, Poznań, Wyd. P.P.2000
6. Jastrzębska G.: Ogniwa słoneczne rozdz.10-Zastosowanie energii Słońca w środkach transportu, WKiŁ, Warszawa.
7. Opydo W.: Urządzenia elektryczne i elektroniczne wyd..PP, Poznań.

Additional bibliography:

1. Pasko M, Piątek Z., Topór _ Kamiński L.: Elektrotechnika Ogólna, wyd Pol. Śl., t.1
2. Praca zbiorowa Praktyczna elektrotechnika ogólna, Rea, Warszawa,

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	10
2. Participation in laboratory classes	15
3. Participation in the consultation for the exam (lectures)	5
4. Participation in the consultation (laboratory)	2
5. Przygotowanie do egzaminu/ Preparation for the exam	10
6. Exam	1
7. Preparation of the laboratory classes and developing reports	5

Student's workload

Source of workload	hours	ECTS
Total workload	76	3
Contact hours	36	1
Practical activities	0	0