POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electrical systems of machines and vehicles [N1MiBP1>UEMiP]

Course

Field of study	**Year/Semester**
Mechanical and Automotive Engineering	2/3
Area of study (specialization)	**Profile of study**
–	general academic
Level of study	**Course offered in**
first-cycle	Polish
Form of study	**Requirements**
part-time	compulsory

Number of hours

Lecture	**Laboratory classes**	**Other**
9	9	0
Tutorials	**Projects/seminars**	
0	0	

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Student has basic knowledge of mathematics and physics

Course objective

Getting to know the theoretical and practical foundations of the operation of DC and AC circuits as well as the construction and operation of selected electrical machines.

Course-related learning outcomes

Knowledge:
Has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems.
Has elementary knowledge of electric drives in machines, including three-phase current, AC and DC motors, frequency and voltage converters, power electronics.
Has elementary knowledge of automation systems, microcontrollers, control algorithms, automatic machines and industrial robots, electronic navigation systems used in machines and wired and wireless

communication systems in local computer networks used in machines.

Skills:
Can properly use modern equipment for measuring major physical quantities, used in machine research and production control.
Can draw a diagram and a simple machine element by hand in accordance with the rules of technical drawing.
Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences:
Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.
Is ready to initiate actions for the public interest.
Is willing to think and act in an entrepreneurial manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Exam at the end of the semester.

Programme content

DC electric circuits (basic concepts, linear and nonlinear elements, Ohm"s law, Kirchhoff"s laws, methods of circuit solving, work, power, energy).
Electric circuits of alternating current (basic concepts, generating alternating current, Ohm"s law and Kirchhoff"s laws, vector and time graphs, work, power, energy).
Transformers - structure and operation.
Electric motors - structure and operation.
Measuring instruments and electrical measurements.

Course topics

Teaching methods

Auditorium lecture

Bibliography

Basic
1. Opydo W.: Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, Wydawnictwo Politechniki Poznańskiej, Poznań, 2012.
2. Opydo W., Kulesza K., Twardosz G.: Urządzenia elektryczne i elektroniczne. Przewodnik do ćwiczeń laboratoryjnych, Opydo W., Kulesza K., Twardosz G, Wydawnictwo Politechniki Poznańskiej, Poznań, 2004.
Additional
1. Bogdan Miedziński: Elektrotechnika. Podstawy i instalacje elektryczne, Wydawnictwo Naukowe PWN, Warszawa 1997.
2. Praca zbiorowa: Vademecum elektryka. COSiW.SEP.Warszawa.2005

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	18	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	32	1,00