COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electronics and Electrical Engineering [S1IZarz1>EiE]

Course

Field of study
Engineering Management

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr inż. Arkadiusz Dobrzycki
arkadiusz.dobrzycki@put.poznan.pl

Lecturers

Prerequisites

Students starting this subject should have basic knowledge in mathematics, physics, as well as the ability to work in a laboratory group.

Course objective

Acquainting with the basic laws of electrical engineering and electronics. Acquiring the ability to read electrical diagrams, recognize elements, build simple electrical and electronic systems. Ability to algebraically solve simple electrical systems. Acquisition of practical skills in the field of calculations, connecting, testing and measuring branched circuits of direct and alternating current and simple analog electronics systems.

Course-related learning outcomes

Knowledge:
The student lists and describes basic electrical quantities, such as voltage, current, and resistance [P6S_WG_16].
The student classifies and characterizes typical industrial technologies, with special emphasis on technologies for the construction and operation of machines [P6S_WG_17].

Skills:
The student analyzes and distinguishes various design tasks in the field of machine construction and operation, presenting the results of their work [P6S_UW_14].
The student demonstrates the application of selected methods for solving problems related to the construction and operation of machines, presenting specific examples of applications [P6S_UW_15].

Social competences:
The student explains the impact of engineering activities on the environment, identifying key aspects and examples related to their responsibility for decisions made [P6S_KR_01].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: assessment of knowledge and skills demonstrated in a written test / problem-based exam (checking the ability to use the acquired knowledge). Individual elements assessed according to the point system, 50% of the maximum number of points is required to pass.
Laboratories: checking messages before performing the exercise in the form of a pass and evaluation of reports To obtain a pass, it is necessary to pass all tickets and obtain positive marks from reports prepared as a team.

Programme content

Lecture: Basic quantities and laws of electrical engineering. Elements and electrical systems of direct and alternating current. Quantities describing the work of electrical systems. Methods of analyzing electrical circuits. Principles of operation of selected electrical devices. Basic electronic components.
Laboratories: the issues covered are related to: selected electrical engineering laws in DC circuits, RLC elements and resonance in single-phase sinusoidal alternating current circuits, circuits with unilateral elements, testing of selected electronic components.

Teaching methods

Lecture: multimedia presentation (including drawings, photos, animations, films) supplemented with examples given on the board, especially computational ones. Taking into account various aspects of the issues presented, including: economic, ecological, legal and social. Presenting a new topic preceded by a reminder of related content known to students in other subjects.
Laboratory classes: independent performance of laboratory exercises (preparation of the position, construction of measuring systems, performance of experiments) with the help and under the supervision of the lecturer.

Bibliography

Basic:
1. Chua L. O., Desoer C. A., Kuh E. S.: Linear and nonlinear circuits, McGraw-Hill Inc., New York 1987.
2. Opydo W., Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, WPP, Poznań 2012.
3. Hemprowicz P., Kiełsznia R, Piłatowicz A., Elektrotechnika i elektronika dla nieelektryków, WNT, Warszawa, 2013.
4. Horowitz P., Hill W., The Art of Electronics, Cambridge University Press, 2015.
5. Alexander Ch, Sadiku M., Fundamentals of Electric Circuits, McGraw-Hill, 2013.
6. PN-HD 60364-4-41:2017-09/A12:2020-01, Instalacje elektryczne niskiego napięcia -- Część 4-41: Ochrona dla zapewnienia bezpieczeństwa -- Ochrona przed porażeniem elektrycznym.
7. Frąckowiak J., Nawrowski R., Zielińska M.: Teoria obwodów. Laboratorium, Wydawnictwo Politechniki Poznańskiej, Poznań 2017.

Additional:
1. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 2013.
2. Krakowski M.: Elektrotechnika teoretyczna, tom 1. Obwody liniowe i nieliniowe., PWN, Warszawa 1995.
3. Jastrzębska G., Nawrowski R.: Zbiór zadań z podstaw elektrotechniki, Wydawnictwo Politechniki Poznańskiej, Poznań 2000.

4. Dobrzycki A., Filipiak M., Komputerowo wspomagana analiza pracy układów czwórnikowych, Academic Journals Poznan University of Technology, nr 89, 2017, 155-162.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00