



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fundamentals of electricity and electronics

Course

Field of study

Power Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Karol Bednarek

Responsible for the course/lecturer:

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tel. 616652659

Faculty of Control, Robotics and Electrical

Engineering

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Prerequisites

Students starting this subject should have knowledge in mathematics, physics at high school level.

Course objective

Introduction of physical quantities and basic laws and theorems in the field of electric engineering and electronics in direct current circuits and alternating current circuits one-phase. Introduction of analytical methods of calculations for electric circuits and rules of connection.

Course-related learning outcomes

Knowledge



Is able to characterize electrical systems, describe and explain the laws and methods of their analysis for DC and AC circuits. Has basic knowledge of electrostatics, magnetism and electromagnetism.

Skills

Is able to recognize and select methods of analysis and testing of electrical circuits. Is able to obtain information from literature and other sources; is able to integrate obtained information, interpret and conclude it.

Social competences

Understands the need for continuous training. He can work in a team.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Assessment of knowledge and skills demonstrated during the course of problem-type credit, realized in the form of written or oral.

Programme content

Basic definitions in field of electrical engineering, basics of electrostatics, elements of electric circuits, arrow convention for the voltage and the current, electric signals and classification, electric circuits laws, basics of magnetism and electromagnetism, methods of analysis of direct current circuits and alternating current circuits (Kirchhoff's laws, Mesh-Current Method, Node-Voltage Method), circuits theorems: Norton's theorem, Thevenin's theorem, Tellegen's theorem), real power, reactive power and complex power, energy in electric circuits, maximum power transfer theorem, magnetic coupled circuits, resonance effect, measurements of power and energy in electric circuits.

Teaching methods

The lecture with blackboard or multimedia presentation (including drawings, photos, animations, films) supplemented with examples given on the board, taking into account various aspects of the issues presented, including: economic, ecological, legal, social and practical examples known to students in everyday life. Presenting a new topic preceded by a reminder of the content of the previous lecture. Presenting material in connection with other objects.

Bibliography

Basic

1. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 1998.
2. Kurdziel R.: Podstawy elektrotechniki, WNT, Warszawa 1973.
3. Krakowski M., Elektrotechnika teoretyczna, tom 1 – Teoria obwodów (tom 2 - Pole elektromagnetyczne), PWN, Warszawa 1999, (1995, 1991, 1973).

Additional

1. Chua L.O., Desoer C.A., Kuh E.S.: Linear and nonlinear circuits, McGraw-Hill Inc., New York 1987.



2. Rawa H., Bolkowski S., Brociek W.: Teoria obwodów elektrycznych. Zadania., PWN, Warszawa 2019.
3. Czarnywojtek P., Kozłowski J., Machczyński W.: Zbiór zadań z podstaw elektrotechniki, Wydawnictwo Uczelni PWSZ w Kaliszu, Kalisz 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,0
Classes requiring direct contact with the teacher	24	1,0
Student's own work (literature studies, preparation to pass the course) ¹	46	2,0

¹ delete or add other activities as appropriate