COURSE DESCRIPTION CARD - SYLLABUS

Course name

Selected issue of electrical engineering

Course

Field of study

Power Engineering

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

0

Other (e.g. online)

0

Tutorials

10

Projects/seminars

0

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

The student starting this subject should have knowledge of mathematics, physics and electrical engineering at the first level. He should also be able to obtain information from specified printed and electronic sources.

Course objective

Extending knowledge about the methods of analysis of sinusoidal and non-sinusoidal alternating current circuits. Getting to know the classical method of transient states analysis in RLC linear systems. Understanding how to calculate circuits with non-sinusoidal periodic waveforms. Learning the theory of four-terminal and filters.

Course-related learning outcomes

Knowledge

1. Has extended knowledge about the analysis of four-phase electric circuits: three-phase, with non-linear elements, in transient states, with periodic non-sinusoidal excitations.

2. Has knowledge of physical phenomena in electrical circuits in transient states and with non-sinusoidal periodic power supply.

Skills

1. Is able to apply knowledge of the theory of electrical circuits necessary to determine the relevant electromagnetic parameters.

2. Is able to obtain information from literature and the Internet, work individually, independently solve tasks in the field of theory of analysis and modeling of electrical circuits.

3. Is able to develop documentation of the results of a simple design or research task in the field of electrical engineering.

Social competences

1. Understands the importance of knowledge in correctly identifying and solving cognitive and practical problems in the field of electrical engineering.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired as part of the lecture is verified on the written exam of in-depth theory on selected issues of electrical engineering. The exam consists of 5-7 questions. Passing threshold: 50% of points. The issues on the basis of which questions are prepared will be sent to students by e-mail using the university e-mail system.

Skills acquired as part of the tutorial classes are verified on the basis of the final test taking place during the last class and consisting of 3-5 tasks differently scored depending on the degree of their difficulty. It is possible to get extra points for activity during classes, and especially for: proposing to discuss additional aspects of the issue, the effectiveness of applying the acquired knowledge when solving a given problem, solving additional tasks. Additional points are a maximum of 10% of the final grade.

Programme content

Lecture: Method of symmetrical components. Linear and nonlinear electric circuits with periodically deformed periodic currents (use of Fourier series, powers, methods of analysis). The classic method of transient states analysis in RLC linear systems (commutation laws, initial conditions, transient and steady component, time constant). Passive crosses (equations, types, connection methods) and passive filters of the LC and RC type (structure, parameters, types, frequency characteristics, application).

Tutorials: solving tutorial tasks in the field of analysis of periodic electric circuits, transients and determining the parameters of passive crosses (filters).

Teaching methods

Lecture: multimedia presentation (drawings, photos, animations) supplemented with examples given on the board, initiating discussions during the lecture.

Tutorials: solving sample tasks on the board, discussions and comments on how to solve problems.

Bibliography

Basic

1. Kurdziel R.: Podstawy elektrotechniki, WNT, Warszawa 1973.

2. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 2008.

3. Szabatin J., Śliwa E.: Zbiór zadań z teorii obwodów. Część 2, Wydawnictwo Politechniki Warszawskiej, Warszawa 2015.

4. Mikołajuk K., Trzaska Z.: Zbiór zadań z elektrotechniki teoretycznej, WNT, Warszawa 1978.

Additional

1. Krakowski M.: Elektrotechnika teoretyczna, PWN, Warszawa 1995.

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

3. Jastrzębska G., Nawrowski R.: Zbiór zadań z podstaw elektrotechniki, Wydawnictwo Politechniki Poznańskiej, Poznań 2000.

Breakdown of average student's workload

	Hours	ECTS
Total workload	105	4,0
Classes requiring direct contact with the teacher	36	1,0
Student's own work (literature studies, preparation for tutorials, preparation for test, preparation for exam) [1]	69	3,0

[1] delete or add other activities as appropriate