

Electrical engineering principles - course description

General information	
Course name	Electrical engineering principles
Course ID	06.2-WE-AutP-EEP-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Automatic Control and Robotics
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2019/2020

Course information	
Semester	1
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	dr hab. inż. Radosław Kłosiński, prof. UZ

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Credit with grade
Laboratory	15	1	-	-	Credit with grade
Class	15	1	-	-	Credit with grade

Aim of the course

- To familiarize students with basic concepts of electrical engineering.
- To mastery by students of basic methods of analysis of electrical circuits in steady state.
- To develop skills in circuit analysis.
- To develop basic skills in the use of basic equipment to measure voltage, current and power.

Prerequisites

Mathematical Analysis, Linear Algebra with Analytic Geometry, Physics

Scope

Basic concepts. Electric charge, current, potential, voltage, electric circuit, resistance, induction coil, capacitor, voltage and current sources, series and parallel connection.

Basic electrical circuit laws. Ohm's law, Kirchhoff's laws, Thevenin's and Norton's theorems, superposition theorem, reciprocity principle.

Electrical circuits analysis methods. Node voltage method, loop analysis method, superposition method, equivalent network methods.

Circuits supplied with sinusoidal sources. Phasor technique; phasor impedance; phasor diagrams; wattles, continuous and apparent power; resonance, magnetically coupled circuits.

Three-phase networks. Three-phase sources, delta (Δ) and wye (Y) configurations, three-phase networks analysis, phasor diagrams.

Teaching methods

Lecture, classes, laboratory exercises.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Knows basic concepts and laws in the field of electrical engineering.		• an evaluation test • an ongoing monitoring during classes	• Lecture
Is able to measure voltage, current and active power and determine the basic parameters of the circuit.		• an evaluation test • an ongoing monitoring during classes	• Laboratory
Analyzes simple DC and sinusoidal alternating current circuits.		• an evaluation test • an ongoing monitoring during classes	• Class

Assignment conditions

Lecture: pass a colokwiun carried at least once in a semesteror.

Exercises: pass tests or final colokwium.

Laboratory: a condition of pass is positive assessment of all laboratory exercises provided for under the program.

Components of the final grade: lecture: 35% + **exercises:** 35% + **laboratory:** 30%

Recommended reading

1. Blackwell W.A., Grigsby L.L.: Introductory network theory, PWS Publishers, 1985
2. Bolkowski S.: Theoretical electrical engineering, theory of electric circuits. T1, WNT, Warsaw, 1982.
3. Cichowska Z., Pasko M.: Tasks in theoretical electrical engineering. Script of Silesian University of Technology Gliwice 1994 (in polish).
4. Cichowska Z., Pasko M.: Lectures in theoretical electrical engineering. Cz. I Basic sections. Cz. II sinusoidally variable currents. Silesian University of Technology Gliwice 1998 (in polish).
5. Mikołajuk K., Trzaska Z.: A set of theoretical electrotechnical assignments. PWN Warsaw 1976 (in polish).

Further reading

Notes

Modified by dr hab. inż. Wojciech Paszke, prof. UZ (last modification: 29-04-2020 08:34)

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