COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computerization of design in electrical engineering [S1Eltech1>KPwE2]

Course

Field of study
Electrical Engineering

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Messages from the lecture in the previous semester and mathematics and physics at the matriculation level. Basic knowledge of computer science and programming. Ability to understand and interpret the transmitted messages and effective self-education in the field related to the chosen field of study.

Course objective

Acquiring the ability to implement in the computer environment (MS Visual Studio C #) selected numerical methods in solving problems in the field of circuit theory and power engineering, learning examples of tools for design in the field of broadly understood electrical engineering.

Course-related learning outcomes

Knowledge:
Knows computer methods used for numerical calculations (integration, solving equations and systems of linear, nonlinear and differential equations, basic optimization methods).

Skills:
Is able to apply knowledge of numerical methods to solve selected issues in the field of electrical circuits

and power engineering necessary to carry out project tasks.He can obtain information from literature and the Internet, work individually, solve tasks in the field of design computerization.

Social competences:
Is able to think and act in an entrepreneurial manner in the field of creating IT applications for design in the field of electrical engineering.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the laboratory is verified during the final class colloquium, consisting in writing a computer program, the subsequent elements of which are more and more numerically advanced. The final grade depends on the degree of advancement of the credit program. Passing threshold: 50% of points. In addition, you can earn bonus points by showing activity and commitment during the semester.

Programme content

Implementation of selected numerical/optimization methods in the MS Visual C# or Matlab Simulink environment. Learning the basics of using AutoCAD.

Course topics

Laboratory exercises:
Basic issues regarding the implementation of numerical methods in the MS Visual Studio C# or Matlab Simulink environment. Examples of methods for numerical integration, approximation and interpolation and their applications in electrical engineering (e.g. trapezoid integration, Lagrange interpolation, mean square approximation). Computer methods enabling the analysis of current flow in electric circuits in steady states containing linear elements (e.g. Jacobi's simple iteration method, Gauss-Siedel, SOR) and non-linear elements (e.g. Newton's method), as well as in transient states (e.g. Euler's, Runge's method) -Kutty). Basic methods for optimization in technology (e.g. gradient method and genetic algorithm). Familiarization with the AutoCAD environment (basic tools, views, etc.).

Teaching methods

Multimedia presentation, illustrated with examples on the board, samples of the program codes displayed on a multimedia projector, initiating discussions during the classes. Additional materials placed in the eKursy platform.

Bibliography

Basic:
1. Kącki E.: Metody numeryczne dla inżynierów, WPŁ, Łódź 2003.
2. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 1998.
3. Guziak T.: Metody numeryczne w elektrotechnice, WPL, Lublin 2002.
4. Fortuna Z.: Metody numeryczne, WNT, Warszawa 1998.

Additional:
1. John Sharp: Microsoft Visual C# 2008 krok po kroku, Wydawnictwo RM, Warszawa 2009.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,00
Classes requiring direct contact with the teacher	25	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	5	0,00