POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Computerization of design in electrical engineering

Course

Field of study	Year/Semester
Electrical engineering	3/6
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
20		
Tutorials	Projects/seminars	

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

mgr inż. Stanisław Mikulski

email: stanislaw.mikulski@put.poznan.pl

tel. 61 665 27 96

Instytut Elektrotechniki i Elektroniki
Przemysłowej

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

News in 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

Understanding selected numerical methods in application to solve 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

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

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:

Knowledge acquired during the lecture is verified during an exam consisting of 5-10 (open) equally scored questions. Passing threshold: 50% of points. Additionaly, there will be quiz at the end of selected lectures. Gathered additional point will be added to score of the exam.

Programme content

Basic issues regarding to the implementation and use of numerical methods in electrical engineering. Examples of approximation and interpolation methods and their application in technical issues (e.g. Lagrange interpolation, mean square approximation). Computer methods enabling the analysis of current flow in electric circuits in steady states containing linear elements (Jacobi, Gauss-Siedl, SOR simple iteration method) and non-linear (Newton method), as well as in transient states (Euler and Runge-Kutta method).
Introduction to basic of artificial intelligence and its application in electrical engineering, e.g. for prediction of RES energy production.

Introduction to basic CAD software (such as: Matlab & Simulink, NEPLAN, OrCAD) used for design electric circuits.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board, initiating discussions during the lecture. Additional materials are placed in the Moodle system.

Bibliography

Basic

[1]   L. Rutkowski, Metody i techniki sztucznej inteligencji. Warszawa: Wydawnictwo Naukowe PWN, 2012.

[2]   D. Spałek, Politechnika Śląska (Gliwice), i Wydawnictwo, Metody numeryczne w elektrotechnice. Gliwice: Wydawnictwo Politechniki Śląskiej, 2020.

[3]   B. Pańczyk i Politechnika Lubelska, Metody numeryczne w przykładach. Lublin: Politechnika Lubelska, 2012.

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

Additional

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

[2]   R. Pratap i M. Korbecki, MATLAB 7: dla naukowców i inżynierów. Warszawa: Wydawnictwo Naukowe PWN, 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	58	2,0
Classes requiring direct contact with the teacher	28	1,0
Student's own work (literature studies, preparation for the exam) [1]	30	1,0

---

[1] delete or add other activities as appropriate