Syllabus of the educational discipline
«THEORY OF ELECTRICAL AND MAGNETIC CIRCUITS»

Cycle of Higher Education	*First cycle of higher education (Bachelor's degree)*
Field of Study	*12 Information Technologies*
Specialty	*123 Computer engineering*
Educational program	*Computer systems and networks*
Discipline status	*Normative*
Teaching language	*English*
Year of studies, semester	*2 year (3 semester)*
Number of credits ECTS	*3 credits*
Distribution by types of trainings and hours of study	*Lectures, Laboratory studies, Independent training*
Form of final assessment	*Test*
Teacher	*Chichura Igor Ivanovich, Senior lecturer of the department of Instrument Engineering*
Teacher's contacts	*igor.chechura@uzhnu.edu.ua*
Course Schedule	*According to the timetable*

The purpose of the discipline is to study the element base, methods of calculation of electrical and magnetic circuits, which can be used in the design, implementation and operation of hardware of computer systems and networks.

As a result of studying the discipline the student must:

know:

- basic phenomena in electrical circuits, symbolism, topological concepts, substitution circuits, basic laws and methods of calculation of electric circuits of direct and sinusoidal voltage. Know the basic characteristics of non-sinusoidal periodic voltages and currents, methods of calculation of linear electrical circuits of non-sinusoidal voltage.

be able to:

- apply graphical, graphoanalytic and analytical methods for calculating nonlinear electric and magnetic circuits;
- determine the basic characteristics of quadrupoles, analyze circles with distributed parameters (long lines) in sinusoidal mode.

Prerequisites for learning

Mathematical Analysis, Linear Algebra and Analytic Geometry, Physics

Content of the educational discipline

Module 1. Linear electric circuits

Topic 1. Direct current
Topic 2. Sinusoidal current
Topic 3. Three-phase circles
Topic 4. Transient processes
Topic 5. Fluid mechanics.

Module 2. Nonlinear electrical and magnetic circuits

Topic 6. Nonlinear electrical circuits
Topic 7. Magnetic circuits
Topic 8. Electrical circuits with distributed parameters
Topic 9. Quadrupole

Course page on the Moodle platform (personal training system)	*Syllabus of the educational discipline, hyperlinks to electronic publications of the discipline, recommended literature, students' attendance, lecture materials, presentations, questions for self-control, methodical materials for laboratory works, tests, tasks for checking students' knowledge.*

	https://moodle.uzhnu.edu.ua

Recommended literature

1. *Fred Alan Fish Fundamental Principles of Electric and Magnetic Circuits. - Forgotten Books, 2018, 216p*
2. *Samuel J. Ling; Jeff Sanny; William Moebs; and Daryl Janzen Introduction to Electricity, Magnetism, and Circuits, University of Saskatchewan, Distance Education Unit, 2018 – 995p.*
3. *P.F. Kelly Electricity and Magnetism. - CRC Press, 2021, - 418p*

Assessment system of learning outcomes

Current control carried out the semester and evaluated by the amount of points (max is 100 points). A minimum amount, that allows a student to get credit is 35 (max is 100 points).
Modular control work is divided into two control works; maximum number of points for each test: 50 points. During the semester, students perform 4 computational works. Maximum number of points for each calculated work: 25 points.
Final (semester) control is carried out in the form of test and evaluated in points (max is 100 points, min is 35 points).

ECTS and national grading scale

Mark scale	ECTS	Exam	Test
90 - 100	A	Excellent	Satisfied
82 - 89	B	Good	
74 - 81	C		
64 - 73	D	Satisfactory	
60 - 63	E		
35 - 59	FX	“Unsatisfactory” with possibility to pass the exam again	“Not satisfied” with possibility to pass the exam again
1 - 34	F	“Unsatisfactory” with obligatory repeated study of the discipline	“Not satisfied” with obligatory repeated study of the discipline