

Title Computer modelling of mechatronic systems	Code 10103242910103201406
Field Electrical Engineering	Year / Semester 5 / 9
Specialty -	Course core
Hours Lectures: 1 Classes: - Laboratory: 1 Projects / seminars: -	Number of credits 5
	Language polish

Lecturer:

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Status of the course in the study program:

Obligatory subject, Faculty of Electrical Engineering, Field: Electrical Engineering, Specialty: Mechatronic Electric Systems, Extramural first-degree studies

Assumptions and objectives of the course:

The student should obtain knowledge of circuit models of electromechanical devices and complex mechatronic systems, solving its equations system. Acquiring the ability of using computer software for numerical simulations

Contents of the course (course description):

Classification of electromechanical device models. General description of circuit models. Mathematical models of electromechanical devices and complex mechatronic systems. Controllers. Control systems with feedback. Solving methods of state equations. Differential forms of loops equations and nodal equations in electrical circuits. Solving methods of nonlinear differential equations. Convergence and stability of numerical schematics for state equations. Simulation algorithms of operating condition of electromechanical devices with two degrees of freedom. Computer systems for solving circuit equations of electromechanical devices. General description of Matlab software. Numerical algorithms implemented in Matlab. Application of Simulink software for analysis of transients in transformers, direct current motors, three phase induction and synchronous machines and machines with electronically commutation. Analysis of selected system with automatic control

Introductory courses and the required pre-knowledge:

Knowledge of theory of electric circuits, control systems, informatics and numerical methods

Courses form and teaching methods:

Lectures with audiovisual systems and computer animations, computer laboratory

Form and terms of complete the course - requirements and assessment methods:

Tests, reports, elaboration of software for simulation of transients in electromechanical devices and mechatronic systems using Matlab

Basic Bibliography:

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Additional Bibliography:

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