COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technical Computer Science (Technical informatics)

Course

Field of study

Mechatronics

Year/Semester

2/3

Area of study (specialization)

-

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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tel. 61 665 23 96

Faculty of Control, Robotics and Electrical Engineering

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge

Basic knowledge of mathematics, computer science, operating systems, programming languages, machines and electric drives.

Skills

Computer skills, Windows operating system, programming in C++ language, formulating and solving mathematical models of electrical actuators.

Social competences

Awareness of necessity for broadening knowledge and skills. Ability to comply with rules during lectures and laboratory classes, ability to communicate with others during classes.

Course objective

The acquisition of the ability to use a computer to solve technical problems and ability to elaborate simple models of phenomena for analysis, synthesis and to control selected electromagnetic actuators of mechatronics systems; making use of commercial software for analysis and synthesis of actuators.

Course-related learning outcomes

Knowledge

Basic knowledge about the use of computer to solve engineering problems.

Knowledge of non-linear circumferential and field mathematical models of electromagnetic actuators and basic methods of solving them.

Knowledge of creating algorithms and computer programmes to solve discrete models of selected electromagnetic actuators.

Knowledge of programming techniques and ways formulation of simulation models in selected commercial programming environments for analysis and simulation of coupled electromagnetic and mechanical phenomena in electromagnetic and electromechanical actuators.

Skills

Ability to formulate and solve phenomena models in electromagnetic actuators.

Ability to elaborate simple discrete models for simulation of phenomena in electromagnetic transducers.

Ability to use the commercial software to the analysis and synthesis of simple electromagnetic transducers.

Social competences

Understanding the requirement of learning by whole life; ability to inspire and organize learning process of other people.

Ability to cooperate and work in team/group taking various roles.

Ability to define priorities leading to task completion.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- credit on the basis of a test consisting of both open and test questions. Scale of estimate: 51-60% - dst(C), 61-70% - dst+(C+), 71-80% - db(B), 81-90% - db+ (B+), 91-100% - bdb(A).

Laboratory:

- awarding a bonus of practical knowledge gained during previous laboratory classes,

- practical verification of ability to elaborate simple models by using commercial software,

- evaluation of knowledge and skills connected with realization of individual and team programming projects.

Receiving additional points for class activity, especially for:

- ability to cooperate with others in the team working practically on particular tasks in laboratory,

- making use of elements and techniques surpassing lecture and laboratory material,

- esthetical care of completed projects.

Programme content

Mathematical models of electromagnetic actuators of rotary linear motion. Methods of solving models equations. Discrete models. Algorithms and computer programmes of analysis of steady state, transient and controlling systems of electromagnetic actuators. Solving of simulation models of electric drive systems in Matlab-Simulink environment. Field analysis of the operating states of the electrical actuators in the Magnet environment.

Teaching methods

Bibliography

Basic

1. Baron B., Metody numeryczne w C++Builder, Helion 2004.

2. Burden R., Faires J.D., Numerical Analysis, PWS Publishers, Prindle, Weber&Schmidt, 1970.

3. Mrozek B., Mrozek Z., MATLAB i Simulink, Wydawnictwo Helion, Gliwice, 2004.

4. Lal K., Rak T., Orkisz K., RTLinux - system czasu rzeczywistego Wydawnictwo Helion, Gliwice, 2003

Additional

1. Hammond P., Sykulski J. K., Engineering Electromagnetism, Physical Processes and Computation, Oxford University Press,1994.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	35	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	35	1,0

[1] delete or add other activities as appropriate