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
Dynamic of systems

Course

Field of study
Electrical Engineering

Area of study (specialization)
Microprocessor Control Systems in Electrical Engineering

Level of study
Second-cycle studies

Form of study
part-time

Year/Semester
2/4

Profile of study
general academic

Course offered in
Polish

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
10		
Tutorials	Projects/seminars	

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
dr hab. inż. Michał Gwóźdź

email: Michal.Gwozdz@put.poznan.pl

tel. 616652646

Wydział Automatyki, Robotyki i Elektrotechniki

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:
mgr inż. Adam Gulczyński

email: Adam.Gulczynski@put.poznan.pl

tel. 616652285

Wydział Automatyki, Robotyki i Elektrotechniki

ul. Piotrowo 3A 60-965 Poznań

Prerequisites

Knows the principles of operation of power electronics, control theory and the principles of mathematical modeling.

Course objective

Acquainting with methods of description, analysis, synthesis and optimization of dynamic systems.

Course-related learning outcomes

Knowledge

1. Has in-depth, ordered and theoretically founded knowledge in the field of electrical circuit analysis; has advanced knowledge of discrete circuits and methods of electric binary synthesis

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2. Has expanded and in-depth knowledge of modeling, analysis and synthesis of electronic and power electronics components and systems

3. Has expanded knowledge in the field of computer-aided design in electrical engineering

Skills

1. Is able to use known methods and mathematical models - if necessary, modifying them accordingly - to analyze and design electrical processes, devices and systems

2. Is able to make a critical analysis of complex electrical systems using the appropriate tools, if necessary modifying the methods of their analysis

Social competences

1. Is aware of the need to develop professional achievements and comply with the principles of professional ethics, fulfill social obligations, inspire and organize activities for the social environment

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by one test-problem colloquium, implemented at the last lecture

Programme content

Introduction to systems dynamics. Description of systems of various physical nature. Continuous and discrete description. Identification, analysis and synthesis of continuous and discrete linear and nonlinear systems. Observation and controllability. Stability of dynamic systems (open and closed). Optimization of dynamic systems. Properties of nonlinear dynamic systems.

Teaching methods

Lecture with multimedia presentation (diagrams, formulas, definitions, etc.) supplemented by the content given on the board.

Bibliography

Basic

1. CHUA L.O., PEN-MIN Lin: Komputerowa analiza układów elektrycznych. Algorytmy i metody obliczeniowe. WNT, Warszawa 1981

2. GÓRECKI H.: Optymalizacja układów dynamicznych.PWN, Warszawa 1993

3. KACZOREK T., DZIELIŃSKI A., DĄBROWSKI W., ŁOPATKA R.: Podstawy teorii sterowania. PWN, Warszawa 1999

4. OSOWSKI S: Modelowanie i symulacja układów i procesów dynamicznych. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2007

5. PUCHAŁA A.: Dynamika maszyn i układów elektromechanicznych. PWN, Warszawa 1977

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6. SZACKA K.: Teoria układów dynamicznych. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1999.

Additional

1. BAKER Gregory L., GOLLUB Jerry P.: Wstęp do dynamiki układów chaotycznych. Wyd. Nauk. PWN, Warszawa 1998.

2. KUDREWICZ Jacek: Nieliniowe obwody elektryczne. Wyd. Nauk.-Techn. WNT, Warszawa 1996.

3. MEISEL J.: Zasady elektromechanicznego przetwarzania energii, WNT, Warszawa 1970

4. PEITGEN H.-O., JÜRGENS H., SAUPE D.: Granice chaosu. Fraktale. Wyd. Nauk.. PWN, Warszawa 1997.

5. WILSON R.J.: Wprowadzenie do teorii grafów. PWN, Warszawa 1985

Breakdown of average student's workload

	Hours	ECTS
Total workload	21	1
Classes requiring direct contact with the teacher	11	1
Student's own work (literature studies, preparation for tests) [1]	10	0

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[1] delete or add other activities as appropriate