STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Dynamic of systems		**1010322331010322649**
Field of study: **Electrical Engineering**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **2 / 3**
Elective path/specialty: **Microprocessor's Control Systems in**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits: **2**
Status of the course in the study program (Basic, major, other): **(brak)**	(university-wide, from another field): **(brak)**	
Education areas and fields of science and art: **technical sciences** **Technical sciences**		ECTS distribution (number and %): **2 100%** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	It knows the control theory and the rule of mathematical modelling
2	**Skills**	It knows to apply the knowledge from the range of control theory and rule of mathematical modelling
3	**Social competencies**	It can think and work enterprisingly in the area of the designing of the control of systems and the mathematical modelling

Assumptions and objectives of the course:

The introduction with methods of description, analysis, synthesis and optimization of dynamic systems

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. to characterize basic criteria of modelling, control and optimization of real systems with methods of the mathematical modeling of dynamic systems - [K_W04+++ K_W14 +++]

Skills:

1. It knows to apply the knowledge from range of modelling, control and optimization of real systems with methods of the mathematical modeling of dynamic systems - [K_U15+++]

Social competencies:

1. it can think and work enterprisingly in the area of the designing of algorithms of the digital signal processing, the control of power electronics systems and the mathematical modeling - [K_K01 ++ K_K02 ++]

Assessment methods of study outcomes

http://www.put.poznan.pl/

Lecture

? the credit of the lecture preceded with the credit of occupations laboratory exercises

Designing work and laboratory exercises:

? the test and awarding the knowledge of need-to-know to realization of placed problems

in the given area of tasks,

? verification skills on every exercises

? evaluation of the knowledge and skills related to the realization of laboratory exercise, the evaluation of the report from done exercises.

Obtaining additional points for activity during exercises, in particular way for:

? proposing to discuss additional aspects of the subject

? effective use of knowledge obtained during solving of given problem;

? comments related to improve teaching material,

? aesthetics of solved problems and reports ? within homework.

Course description

The introduction into the dynamics of systems. The description of systems about the various physical nature. The description continuous and discreet. The identification, the analysis and the synthesis of linear systems and non-linear continuous and discreet. The observability and the governableness. The stability of dynamic (open and closed) systems. The optimization of dynamic systems. Properties of non-linear dynamic systems.

Basic bibliography:

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

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

Additional bibliography:

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

Result of average student's workload

Activity	Time (working hours)
1. participation in the lectures	15
2. participation in the laboratory exercises	15
3. participation in consultations on the lecture	5
4. participation in consultations on the laboratory exercises	10
5. preparation for the laboratory exercises	10
6. preparation for the exam	10
7. preparation for the laboratory exercises pass	10
8. participation in the exam	5

Student's workload

Source of workload	hours	ECTS
Total workload	80	2
Contact hours	50	2
Practical activities	0	0

http://www.put.poznan.pl/