



## MODULE DESCRIPTION

Module code	
Module name	<b>Systemy dynamiczne</b>
Module name in English	<b>Dynamic Systems</b>
Valid from academic year	<b>2012/2013</b>

## MODULE PLACEMENT IN THE SYLLABUS

Subject	<b>Computer Science</b>
Level of education	<b>1<sup>st</sup> degree</b> <i>(1st degree / 2nd degree)</i>
Studies profile	<b>General</b> <i>(general / practical)</i>
Form and method of conducting classes	<b>Full-time</b> <i>(full-time / part-time)</i>
Specialisation	
Unit conducting the module	<b>The Department of Control and Management Systems</b>
Module co-ordinator	<b>Stefański Tadeusz, PhD hab., Eng.</b>
Approved by:	

## MODULE OVERVIEW

Type of subject/group of subjects	<b>Major</b> <i>(basic / major / specialist subject / conjoint / other HES)</i>
Module status	<b>Compulsory</b> <i>(compulsory / non-compulsory)</i>
Language of conducting classes	<b>Polish</b>
Module placement in the syllabus - semester	<b>3<sup>rd</sup> semester</b>
Subject realisation in the academic year	<b>Winter semester</b> <i>(winter / summer)</i>
Initial requirements	<b>Mathematical Analysis and Algebra, Discrete Mathematics, the Fundamentals of Electronics, and Digital Metrology</b> <i>(module codes / module names)</i>
Examination	<b>No</b> <i>(yes / no)</i>
Number of ECTS credit points	<b>3</b>

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester	<b>15</b>		<b>15</b>		

## TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS



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<b>Module target</b>	The aim of the module is to familiarise a student with theoretical fundamentals of continuous and discrete dynamical systems (together with a mathematical description and an analysis of these systems).
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Effect symbol	Teaching results	Teaching methods (l/c/lp/other)	Reference to subject effects	Reference to effects of a field of study
W_01	A student has knowledge as regards theoretical fundamentals of continuous and discrete dynamical systems.	l/l	K_W05	T1A_W02
W_02	A student has knowledge as regards a mathematical description of continuous and discrete dynamical systems.	l/l	K_W05	T1A_W02
W_03	A student has knowledge as regards the methods of examining the stability of continuous and discrete dynamical systems.	l/l	K_W05	T1A_W02
U_01	A student can: analyse the phenomena taking place in dynamical systems, describe them with mathematical relationships, determine time waveforms of basic values of these systems, and make appropriate calculations.	l/l	K_U07	T1A_U09
U_02	A student can: apply appropriate analytical and simulation methods to solve the issue of dynamical systems analysis, analyse the results and draw appropriate conclusions.	l/l	K_U07	T1A_U08
K_01	A student is aware of the impact of technological solutions on the environment and understands the non-technical aspects and effects of these activities.	l/l	K_K02	T1A-K02
K_02	A student is aware of rapid progress of knowledge (as regards the methods and technologies of theoretical and simulation analysis) and understands the necessity of continuous education.	l/l	K_K01	T1A-K01

**Teaching contents:**

**Teaching contents as regards lectures**

Lecture number	Teaching contents	Reference to teaching results for a module
1.	Theoretical fundamentals of continuous dynamical systems.	W_01 U_01
2.	Theoretical fundamentals of discrete dynamical systems.	W_01 U_01
3.	Description methods of continuous and discrete linear systems (differential and discrete differential equations).	W_02 U_02
4.	Description methods of continuous and discrete linear systems (transmittances and equations of state).	W_02 U_02
5.	Analysis methods of continuous and discrete linear systems (time and frequency characteristics).	W_02 U_02
6.	The stability of linear dynamic systems.	W_03 U_02
7.	Practical applications of describing systems dynamics.	W_02 W_03 U_02 K_01 K_02



8.	Obtaining a credit for the lectures.	W_01 W_02 W_03 U_01 U_02 K_01 K_02
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### Teaching contents as regards laboratory classes

Laboratory class number	Teaching contents	Reference to teaching results for a module
1.	Introduction.	W_01 U_01
2.	Time characteristics.	W_02 U_02
3.	Frequency characteristics – part 1.	W_02 U_02
4.	Frequency characteristics – part 2.	W_02 U_02
5.	The analysis of a dynamic object.	W_02 U_02
6.	Phase plane.	W_02 U_02
7.	Linear servomechanism.	W_02 W_03 U_02
8.	Obtaining a credit for laboratory classes.	W_01 W_02 W_03 U_01 U_02

### The methods of assessing teaching results

Effect symbol	Methods of assessing teaching results <i>(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)</i>
W_01 W_02 W_03 U_01 U_02	Test 1 – obtaining a credit for laboratory classes
W_01 W_02 W_03 U_01 U_02 K_01 K_02	Test 2 – obtaining a credit for the lectures

### STUDENT'S INPUT

ECTS credit points		Student's workload
	Type of student's activity	
1	Participation in lectures	15
2	Participation in classes	
3	Participation in laboratories	15
4	Participation in tutorials (2-3 times per semester)	10
5	Participation in project classes	



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6	Project tutorials	
7	Participation in an examination	
8		
9	<b>Number of hours requiring a lecturer's assistance</b>	<b>40</b> <i>(sum)</i>
10	<b>Number of ECTS credit points which are allocated for assisted work</b> <i>(1 ECTS credit point=25-30 hours)</i>	<b>1.6</b>
11	Unassisted study of lecture subjects	<b>5</b>
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	<b>10</b>
14	Unassisted preparation for laboratories	<b>5</b>
15	Preparing reports	<b>10</b>
16	Preparing for a final laboratory test	<b>5</b>
17	Preparing a project or documentation	
18	Preparing for an examination	<b>5</b>
19	Preparing questionnaires	
20	<b>Number of hours of a student's unassisted work</b>	<b>35</b> <i>(sum)</i>
21	<b>Number of ECTS credit points which a student receives for unassisted work</b> <i>(1 ECTS credit point=25-30 hours)</i>	<b>1.4</b>
22	<b>Total number of hours of a student's work</b>	<b>75</b>
23	<b>ECTS credit points per module</b> <i>1 ECTS credit point=25-30 hours</i>	<b>3</b>
24	<b>Work input connected with practical classes</b> <i>Total number of hours connected with practical classes</i>	<b>45</b>
25	<b>Number of ECTS credit points which a student receives for practical classes</b> <i>(1 ECTS credit point=25-30 hours)</i>	<b>1.8</b>