Kielce University of Technology
FACULTY OF MANAGEMENT AND COMPUTER MODELLING

MODULE DESCRIPTION

Module code	full-time studies:	**Z-ZIP1-E-605**
	part-time studies:	**Z-ZIPN1-E-605**
Module name	**Laboratory in Fundamentals of Automation**	
Module name in Polish	**Laboratorium z podstaw automatyzacji**	
Valid from academic year	**2019/2020**	

MODULE PLACEMENT IN THE SYLLABUS

Field of study	**MANAGEMENT AND PRODUCTION ENGINEERING**
Level of education	**1st degree**
Studies profile	**General**
Form and method of conducting classes	**Full-time and Part-time**
Specialisation	**All**
Unit conducting the module	**The Department of Automatics and Robotics in the Laser Processing Research Centre**
Module co-ordinator	**Leszek Płonecki, PhD, DSc**
Approved by:	**Dariusz Bojczuk, PhD, DSc**

MODULE OVERVIEW

Type of subject / group of subjects	**Major**
Module status	**Compulsory**
Language of conducting classes	**English**
Module placement in the syllabus - semester	**Semester VI**
Initial requirements	**No requirements**
Examination (YES/NO)	**NO**
Number of ECTS credit points	**1**

Method of conducting classes		Lecture	Classes	Laboratory	Project	Other
Per semester	full-time studies:			**15**		
	part-time studies:			**9**		

TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Skills	U01	A student is able to build a simulation model of an element or an automation system.	ZIP1_U14
	U02	A student can experimentally determine a response of the system to a given disturbance.	ZIP1_U09
	U03	A student can experimentally determine frequency characteristics of the system.	ZIP1_U09
	U04	A student can test system stability and determine the values of quality indicators of an automation system for a real systems or its simulation model.	ZIP1_U14
	U05	A student can make a synthesis of an automation system using basic methods.	ZIP1_U03
	U06	A student can contribute to teamwork by accepting various roles in a team.	ZIP1_U02
Social competences	K01	The student is aware of the responsibility for making decisions and is ready to follow the principles of teamwork.	ZIP1_U02
	K02	A student understands the necessity of continuous improvement of his/her knowledge as regards automation systems with reference to their dynamic development.	ZIP1_K01
	K03	A student understands the usefulness of applying simulation tests of automated systems.	ZIP1_U14

TEACHING CONTENTS

Method of conducting classes	Teaching contents
Laboratory	Modelling elements and systems. Determining the characteristics of basic elements. Determining the characteristics of PID controllers. Determining freqency characteristics. Testing the stability of systems. Testing a heat regulation system. Testing on-off control.

METODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes *(select X)*					
	Oral exam	Written exam	Test	Project	Statement	Other
U01			X		X	
U02			X		X	
U03			X		X	
U04			X		X	
U05			X		X	
U06					X	X
K01						X
K02						X
K03						X

FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Laboratory	Credit with grade	Written tests prior to the performance of individual exercises. Assessment of the correctness of the exercise and the reports on the performed tests. The assessment of the laboratory exercises is an average assessment taking into account the grades from tests and reports (the condition of passing all exercises is passing all exercises by obtaining at least 50% of points). Written test at the end of the exercises for students with an average lower than the minimum allowing them to pass the exercises and giving the opportunity to raise the grade for the exercises.

STUDENT WORKLOAD

No.	Type of student's activity	Student's workload full-time					Student's workload part-time					Unit
		Lc	C	Lb	P	O	Lc	C	Lb	P	O	
1.	Participation in the activities			15					9			h
2.	Other (consultation, exam)			2					2			h
3.	**Number of hours of a student's assisted work**	**17**					**11**					h
4.	**Number of ECTS credit points which are allocated for assisted work**	**0,7**					**0,4**					ECTS
5.	**Number of hours of a student's unassisted work**	**8**					**14**					h
6.	**Number of ECTS credit points which a student receives for unassisted work**	**0,3**					**0,6**					ECTS
7.	**Work input connected with practical classes**	**25**					**25**					h
8.	**Number of ECTS credit points which a student receives for practical classes**	**1,0**					**1,0**					ECTS
9.	**Total number of hours of a student's work**	**25**					**25**					h
10.	**Punkty ECTS za moduł** *1 ECTS=25 hours*	**1**										ECTS

Balance of ECTS points

LITERATURE

1. Astrom K., Murray R. (2008). *Feedback Systems. An Introduction for Scientists and Engineers*, Princeton University Press (Available online).
2. Getachew M. (2008), *Fundamentals of Automation Technology,* Festo Didactic GmbH & Co.KG (Available online).

3. Not S.Y. (ed.) (2009), *Springer Handbook of Automation*, Springer-Verlag Berlin Heidelberg (Available online).
4. Shell R.L., Hall E.L. (eds.) (2000), *Handbook of Industrial Automation,* Marcel Dekker, Inc. (Available online).