MODULE DESCRIPTION

Module code	full-time studies:	**Z-ZIP1-E-303a**
	part-time studies:	**Z-ZIPN1-E-303a**
Module name	**Logic**	
Module name in Polish	**Logika**	
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	**Department of Mathematics and Physics**
Module co-ordinator	**Beata Maciejewska, PhD, DSc**
Approved by:	**Dariusz Bojczuk, PhD, DSc**

MODULE OVERVIEW

Type of subject / group of subjects	**Basic**
Module status	**Non-compulsory**
Language of conducting classes	**English**
Module placement in the syllabus - semester	**Semester III**
Initial requirements	**No requirements**
Examination (YES/NO)	**NO**
Number of ECTS credit points	**3**

Method of conducting classes		**Lecture**	**Classes**	**Laboratory**	**Project**	**Other**
Per semester	full-time studies:	**20**	**15**			
	part-time studies:	**12**	**9**			

TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Knowledge	W01	A student has elementary knowledge from the field of the classical propositional calculus and quantifications, modular arithmetic, and the relations and set theories.	ZIP1_W01
Skills	U01	A student is able to create a sentence of a natural language.	ZIP1_U14
	U02	A student can verify deductive rules and conduct correct deduction.	ZIP1_U14
	U03	A student can conduct logically correct reasoning.	ZIP1_U14
Social competences	K01	A student understands the need to improve the acquired skills and knowledge. A student can comprehend the elementary relationship between the workload and its effect.	ZIP1_K01
	K02	A student is aware of the responsibility for his/her own work and is ready to comply with the rules of team work and to bear the consequences of the tasks completed collectively.	ZIP1_K04

TEACHING CONTENTS

Method of conducting classes	Teaching contents
Lecture	Forming the schemata of sentences concerning the natural language. Simple and complex sentences. Logic functors. Logic values of formulas. The notion of tautology. The methods of examining formulas: the zero-one method and the contradiction method. The principles of inference. Examining inference correctness. The method of proof by induction. Sets. The dependencies among sets. Operations on sets. The laws of the set calculus. Relations. Cartesian product. Domains and the relation field. The properties of relations. Operations on relations. The dependencies among relations. Sentence schemata of the natural language in relations to the predicate calculus. Tautologies and counter-tautologies in the classical predicate calculus. The types of names, relations between the names, the types of definitions, and the errors appearing in definitions.
Classes	Forming the schemata of sentences concerning the natural language. Logic values of formulas. The methods of examining formulas: the zero-one method and the contradiction method. The principles of inference. Examining inference correctness. The method of proof by induction. Sets. The dependencies among sets. Operations on sets. The laws of the set calculus. Domains and the relation field. The properties of relations. Operations on relations. The dependencies among relations. Sentence schemata of the natural language in relations to the predicate calculus.Tautologies and counter-tautologies in the classical predicate calculus.

METODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes *(select X)*					
	Oral exam	**Written exam**	**Test**	**Project**	**Statement**	**Other**
W01			X			
U01			X			
U02			X			
U03			X			
K01						X
K02						X

FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Lecture	Credit with grade	Obtaining at least 50% of test points during the class.
Classes	Credit with grade	Obtaining at least 50% of test points during the class.

STUDENT WORKLOAD

Balance of ECTS points												
No.	Type of student's activity	Student's workload										Unit
		full-time					part-time					
1.	Participation in the activities	Lc	C	Lb	P	O	Lc	C	Lb	P	O	h
		20	15				12	9				
2.	Other (consultation, exam)	2	2				2	2				h
3.	**Number of hours of a student's assisted work**	**39**					**25**					h
4.	**Number of ECTS credit points which are allocated for assisted work**	**1,6**					**1,0**					ECTS
5.	**Number of hours of a student's unassisted work**	**36**					**50**					h
6.	**Number of ECTS credit points which a student receives for unassisted work**	**1,4**					**2,0**					ECTS
7.	**Work input connected with practical classes**	**32**					**32**					h
8.	**Number of ECTS credit points which a student receives for practical classes**	**1,3**					**1,3**					ECTS
9.	**Total number of hours of a student's work**	**75**					**75**					h
10.	**Punkty ECTS za moduł** *1 ECTS=25 hours*	**3**										ECTS

LITERATURE

1. Grimaldi R.P. (2005), *Discrete and Combinatorial Mathematics – An Applied Introduction,* Addison-Wesley Publishing Company.
2. Ross K.A., Wright C.R. (2003), *Discrete Mathematics,* 5th Edition Prentice Hall 2002, https://www.perfect24u.com/wp-content/uploads/2021/08/Kenneth-A.-Ross-Charles-R.-Wright-Discrete-Mathematics-5th-Edition-Prentice-Hall-2002.pdf
3. Walicki M. (2011)*, Introduction to Mathematical Logic, World Scientific Publishing Co. Pte. Ltd.*