MODULE DESCRIPTION

Module code	full-time studies:	**Z-ZIP1-E-210**
	part-time studies:	**Z-ZIPN1-E-210**
Module name	**Fundamentals of Computers Science**	
Module name in Polish	**Podstawy informatyki**	
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 Computer Science Technologies**
Module co-ordinator	**Sławomir Koczubiej, PhD**
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 II**
Initial requirements	**Information Technologies**
Examination (YES/NO)	**NO**
Number of ECTS credit points	**3**

Method of conducting classes		**Lecture**	**Classes**	**Laboratory**	**Project**	**Other**
Per semester	full-time studies:	**15**		**30**		
	part-time studies:	**9**		**18**		

TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Knowledge	W01	A student knows the basic computational and data processing algorithms.	ZIP1_W05
	W02	A student has a knowledge of simple and complex data types (array, list, file, object).	ZIP1_W05
	W03	A student has a knowledge of the syntax, grammar and instructions of the selected programming language, its basic library and built-in functions.	ZIP1_W05
	W04	A student has a knowledge of modern web and internet applications.	ZIP1_W04 ZIP1_W05
	W05	A student has a knowledge of application software for scientific and engineering calculations (CAS)	ZIP1_W04 ZIP1_W05
Skills	U01	A student is able to implement simple algorithms in a programming language.	ZIP1_U07 ZIP1_U14
	U02	He can solve basic problems in the field of mathematical analysis, financial mathematics, algebra, basics of statistics, present the results of calculations in a graphical form using the mathematical and statistical calculations package.	ZIP1_U07 ZIP1_U14
	U03	Can use technical documentation, textbooks and online resources to expand his knowledge of programming languages and computing packages.	ZIP1_U07 ZIP1_U14
Social competences	K01	Is ready to work in a team while solving common tasks. Interacts with other team members at various stages of problem solving	ZIP1_K04

TEACHING CONTENTS

Method of conducting classes	Teaching contents
Lecture	Introduction to programming. Semantics and syntax of a programming language. Algebraic and logical expressions. Input / output instructions. The process of translating and starting the program. Data representation in computer memory. Basic data types: numeric, character, enumerated, other. Simple control statements: conditional and selection. Iterative control statements - loops. Using built-in language functions and libraries. Writing programs with own procedures and functions. Passing parameters to subroutines. Variable scope. File type Supports various types of files (text, binary). Computer aided engineering calculations - CAS software (Computer Algebra System). Introduction to the selected software 5. Numerical and symbolic calculations in the field of mathematical analysis, algebra and statistics in the selected CAS system. System communication with text disk files.

Laboratory	Defining simple algorithms, writing in various notations (eg in the form of a network of actions). Simple data types (numeric, character). Variables, operators and expressions. Assignment instruction. Communication with the user: input / output instructions. Control statements: conditional and selection statements. Converting data types. Using library and built-in functions. Iterative control statements - loops. Programming with the use of the array type and derived types. Defining your own functions and procedures. Variable scope. Parameters of procedures and functions and ways of their transfer. Programming with the use of text and binary files. Application software of CAS type - environment, notation of arithmetic expressions and basic functions. Generating graphs of functions 6. CAS software. Operations on vectors and matrices. Solving equations, systems of equations, inequalities. Statistical analysis.

METODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes *(select X)*					
	Oral exam	Written exam	Test	Project	Statement	Other
W01			X			
W02			X			
W03			X			
W04			X			
W05			X			
U01			X			
U02			X			
U03			X			
K01						X

FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Lecture	Credit with grade	Obtaining at least 50% of the points from the test during the lecture.
Laboratory	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
		15		30			9		18			
2.	Other (consultation, exam)	2		2			2		2			h
3.	**Number of hours of a student's assisted work**	**49**					**31**					h
4.	**Number of ECTS credit points which are allocated for assisted work**	**2,0**					**1,2**					ECTS
5.	**Number of hours of a student's unassisted work**	**26**					**44**					h
6.	**Number of ECTS credit points which a student receives for unassisted work**	**1,0**					**1,8**					ECTS
7.	**Work input connected with practical classes**	**50**					**50**					h
8.	**Number of ECTS credit points which a student receives for practical classes**	**2,0**					**2,0**					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. Heineman G. (2021), *Learning Algorithms: A Programmer's Guide to Writing Better Code*, O'Reilly Media.
2. Louridas P. (2020), *Algorithms*, The MIT Press.
3. Faster L. (2021), *Python Essentials*, Independently published (Amazon).
4. Kumar S. (2016), *Practical Data Analysis*, Packt Publishing.