



### MODULE DESCRIPTION

Module code	full-time studies:	<b>Z-ZIP1-E-508a</b>
	part-time studies:	<b>Z-ZIPN1-E-508a</b>
Module name	<b>Programming Languages – C++</b>	
Module name in Polish	<b>Języki programowania – C++</b>	
Valid from academic year	<b>2019/2020</b>	

### MODULE PLACEMENT IN THE SYLLABUS

Field of study	<b>MANAGEMENT AND PRODUCTION ENGINEERING</b>
Level of education	<b>1st degree</b>
Studies profile	<b>General</b>
Form and method of conducting classes	<b>Full-time and Part-time</b>
Specialisation	<b>All</b>
Unit conducting the module	<b>Department of Computer Science Technologies</b>
Module co-ordinator	<b>Marzena Nowakowska, PhD, DSc</b>
Approved by:	<b>Dariusz Bojczuk, PhD, DSc</b>

### MODULE OVERVIEW

Type of subject / group of subjects	<b>Major</b>
Module status	<b>Non-compulsory</b>
Language of conducting classes	<b>English</b>
Module placement in the syllabus - semester	<b>Semesetr V</b>
Initial requirements	<b>Fundamentals of Computer Science ComputerScience-(VisualBasic/Android) Programming</b>
Examination (YES/NO)	<b>NO</b>
Number of ECTS credit points	<b>3</b>

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

## TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Knowledge	W01	A student knows and understands the principles of functioning of computer programs and managing them in Windows environment.	ZIP_W05
	W02	A student has basic knowledge as regards data types and selecting those types to solve a specific programming task.	ZIP_W05
	W03	A student understands a modular structure of a computer program and the need of utilizing C++ built-in functions in IDE environment and their own programmer's functions	ZIP_W05
Skills	U01	A student is able to design and build a window application using ready objects of the C++ programming system in the IDE as well as his/her own programming solutions.	ZIP_U07
	U02	A student is able to make the analysis of a simple source code as well as to introduce modifications in the code of an existing program.	ZIP_U07
	U03	A student has the ability of defining his/her own programmer's functions as well as utilising them in a computer application created by him/her.	ZIP_U07
	U04	A student has the skills of elaborating algorithms to solve various programming tasks according to the principles of universal logic.	ZIP_U07
Social competences	K01	A student understands the necessity of continuous usage and enrichment of his/her knowledge as regards algorithmic operations.	ZIP_K01
	K02	A student is ready to work individually and in a group (by accepting diverse roles).	ZIP_K04

## TEACHING CONTENTS

Method of conducting classes	Teaching contents
Lecture	<p>IDE working environment. The structure of a C++ program. Structure of a C++ application in the IDE. Creation of a source code. Component palette, communication with the user.</p> <p>Basic language statements. Type conversion. Simple data types. Selected operators, their precedence and operational sequence.</p> <p>The algorithms of iterative processing. Arrays and loop statements.</p> <p>Pointer types. Pointer and dereference operators. Address arithmetic. Working with arrays. Control in the program using the loop statements.</p> <p>Defining functions and passing parameters. The elements of objective programming – using some example components available in IDE. The properties and methods of a class as tools used when utilising objects.</p> <p>Text string class: properties and methods. Text processing.</p> <p>Organising the access to a text file using dialogue components. The co-operation of an application with a text file. Data transmission between the application and the text file.</p>

Laboratory	<p>The structure of a project in ODE environment. Communicating an application with a user. Collection of standard objects.</p> <p>Data type conversion and arithmetic operations. The sequence of statement execution within a computer program. Control in a computer program. Input/Output (I/O) operations in a computer program..</p> <p>Calculation algorithms. Iterative processing of numerical data. Implementing calculation algorithms in C++ application created in IDE environment. Arrays and loop statements: calculating statistics from numerical arrays.</p> <p>Iterative array processing using text type class Iterative array processing using text type classes.</p> <p>User function as a class component and as an external function. Global variables. Passing function parameters.</p> <p>String processing. Iterative text processing: statistics, searching and modifying texts. Organising access to text files. Data transmission between disk memory and computer memory (array structures and visual form components). Creating an application that works with a text file.</p>
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### METHODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes <i>(select X)</i>					
	Oral exam	Written exam	Test	Project	Statement	Other
W01			X			X
W02			X			X
W03			X			X
U01			X			X
U02			X			X
U03			X			X
U04			X			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 the points in the final test.
Laboratory	Credit with grade	Obtaining at least 50% of the points from the colloquia during the classes.

## STUDENT WORKLOAD

Balance of ECTS points												
No.	Type of student's activity	Student's workload										Unit
		full-time					part-time					
		Lc	C	Lb	P	O	Lc	C	Lb	P	O	
1.	Participation in the activities	15		30			9		18			h
2.	Other (consultation, exam)	2		2			2		2			h
3.	<b>Number of hours of a student's as- sisted work</b>	<b>49</b>					<b>31</b>					h
4.	<b>Number of ECTS credit points which are allocated for assisted work</b>	<b>2,0</b>					<b>1,2</b>					ECTS
5.	<b>Number of hours of a student's un- assisted work</b>	<b>26</b>					<b>44</b>					h
6.	<b>Number of ECTS credit points which a student receives for unassisted work</b>	<b>1,0</b>					<b>1,8</b>					ECTS
7.	<b>Work input connected with practical classes</b>	<b>50</b>					<b>50</b>					h
8.	<b>Number of ECTS credit points which a student receives for practical classes</b>	<b>2,0</b>					<b>2,0</b>					ECTS
9.	<b>Total number of hours of a stu- dent's work</b>	<b>75</b>					<b>75</b>					h
10.	<b>Punkty ECTS za modul</b> <i>1 ECTS=25 hours</i>	<b>3</b>										ECTS

## LITERATURE

1. Gregorie M., (2021), *Professional C++, 5th Edition*, John Wiley and sons Ltd.
2. Stroustrup B. (2022), *A tour of C++*, Pearson.
3. Stroustrup B. (2013), *The C++ Programming Language*, Addison-Wesley.
4. Swart B., Cashman M., Gustavson P., Hollingworth J. (2003), *Borland C++Builder 6 Developer's Guide*, SAMS, available from:  
[http://140.129.118.16/~richwang/ktlan/BCPPB6\\_Book\\_unlocked.pdf](http://140.129.118.16/~richwang/ktlan/BCPPB6_Book_unlocked.pdf).
5. A student can find the information in the Internet for the key phrases: *C+ builder tutorials, programming in C++*.