COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computer programming and the C language

Course

Field of study
Technical and Information Technology Education

Year/Semester
1/2

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:

Prerequisites

Basic knowledge of computer science and mathematics. The ability to write computer programs in any high-level programming language at the basic level, algorithmizing tasks, and logical and abstract thinking. Understanding the need to develop computer programs to increase productivity, computations, visualization of results, and presentation of the data collected in databases.

Course objective

The main purpose of the subject is to familiarize the student with the basic principles of the C/C++

programming languages, gaining the skills of self-development of applications using the basic rules of these languages and algorithmizing tasks.

Course-related learning outcomes

Knowledge

W01 In-depth knowledge of the concepts and computer science issues necessary to understand programming in high-level languages, including C/C++. K1_W01, K1_W08

W02 Knowledge and understanding of the elements of the C/C++ programming language that are necessary to create extensive computer programs within the scope specific to the field of study. K1_W01, K1_W08

W03 Knowledge that is necessary to develop algorithms and implement them in the C/C++ programming language on its own. K1_W01, K1_W08

Skills

U01 Ability to create computer programs using the C/C++ programming language. K1_U01, K1_U02, K1_U04, K1_U11

U02 Ability to use the acquired skills in creating algorithms and effective implementation of computational tasks and engineering problems. K1_U01, K1_U02, K1_U04, K1_U11

U03 Self-learning skills in learning advanced C/C++ and other high-level languages. K1_U01, K1_U02, K1_U04, K1_U11

U04 Ability to obtain information from literature, databases and other available sources of knowledge. K1_U01, K1_U02, K1_U04, K1_U11

Social competences

K01 Responsibility for given tasks, e.g. an individual programming project. K1_K01, K1_K03, K1_K05

K02 Understanding of the need for continuous learning in order to improve professional competences, acquiring up-to-date knowledge of programming languages and computer science (e.g., by reading computer journals, participating in postgraduate courses and studies). K1_K01, K1_K03, K1_K05

K03 Ability to work on the assigned task independently and in the team taking on different roles in it. K1_K01, K1_K03, K1_K05

K04 Understanding of the importance of algorithm development in the process of creating efficient computer programs. K1_K01, K1_K03, K1_K05

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures

Written exam verifying a knowledge and a proper understanding of the field of study.

Laboratory classes

Project tasks required in the form of computer programs and evaluated at the end of laboratory classes and/or during exams.

Programme content

Basic concepts and issues:

- programming languages (low- and high-level languages and their characteristics),

- history of the C/C++ programming languages and their advantages,

- C++ standard,

- introduction to integrated development environment Visual Studio,

- numeral systems – binary and hexadecimal numeral systems,

- standards for representing numbers, letters and special characters.

Data types and variables:

- definition and division into simple (scalar) and structural data types,

- characteristics of simple data types – integer, floating-point, logical, character.

C++ lexical units (keywords, identifiers, literals, constants).

Operators:

- arithmetic operators (additive, multiplicative, incremental, decremental),

- logical operators (conjunctions, alternatives, negation),

- assignment and comparison operators,

- conditional operator.

Pointers, tables and structures:

- pointer types and variables – declaration, initiation and dereference,

- void data types,

- reference data types and variables,

- static arrays – declaration, initiation, access to array elements,

- structures – declaration and access to structure elements,

- dynamic arrays.

Expressions and instructions of the C/C++ language.

Pointer arithmetic – a relationship between static arrays and pointers.

File input/output operations.

Functions of the C/C++ language.

Teaching methods

Lectures: Multimedia presentation illustrated with example programs written in the C/C++ language.

Laboratory classes: Writing of computer programs in the C/C++ language.

Bibliography

Basic

1. H. M. Deitel, P. J. Deitel, Arkana C++ Programowanie, Wydawnictwo RM, Warszawa 1998.

2. S. Prata, Szkoła Programowania. Język C++, Wydawnictwo Helion, Gliwice 2006.

3. A. Zalewski, Programowanie w językach C i C++ z wykorzystaniem pakietu Borland C++, Wydawnictwo Nakom, Poznań 1996.

4. J. Grębosz, Symfonia C++. Programowanie w języku C++ orientowane obiektowo, Tom 1,2,3, Oficyna Kallimach, Kraków 1999.

Additional

1. D. E. Knuth, Sztuka programowania. Tom1 Algorytmy podstawowe, Wydawnictwa Naukowo-Techniczne, Warszawa 2002.

2. N. Wirth, Algorytmy + struktury danych = programy, Wydawnictwa Naukowo-Techniczne, Warszawa 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	3,0
Classes requiring direct contact with the teacher	51	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	50	2,0

[1] delete or add other activities as appropriate