SYLLABUS

SUBJECT: FUNDAMENTALS OF PROGRAMMING

TEACHER: Prof. Marek Matczak, PhD, DSc

COURSE DESCRIPTION :

The purpose of the course is to provide the fundamentals of programming.

Lecture: Stages of the program formation. The concept and features of the algorithm. Ways of writing the algorithm. Basic programming constructs. Elements of the flowchart. The functional scheme of the structure of the computer and the scheme and the command cycle of the processor as executives for the algorithm. The meta-language of writing the algorithm. Types of translators. Programming paradigms. The criteria for the classification of programming languages. Types of programming languages. The criteria for the classification of computer memory as the storage of data and programs. Types of computer memory. Physical bi-stability of computer memory as the basis for methods of encoding information. Forms of information (numeric, text, sounds, images) and methods for their conversion to binary form (conversion of number systems, table of ASCII codes, sampling and quantization of multimedia signals in analog-to-digital converters) as the basis for data structures. Signal-to-noise ratio as a criterion for the quality of multimedia information. Simple and structured data types and operations performed on them. Organization of main memory and dynamic memory allocation. Computational complexity. Programming in C language.

Classes: Practical exercises of building algorithms in different writing forms and converting them to programs in C language.

LEARNING OUTCOMES:
A student receives a basic knowledge about fundamentals of programming and the ability of reading with understanding programs saved in an imperative programming language, symbolic execution of simple programs for verification, and writing and running simple programs of the size of the order of 100 lines of the code in C language.

GRADING POLICY:

Lecture: Exam in the form of written test.

Classes: Demonstrating the above formulated ability.

TIMETABLE
Lecture: 2 hours/every week
Classes: 3 hours/every week

TEXTBOOK AND REQUIRED MATERIALS:

1. Discovering Computers: Fundamentals, Fifth Edition (Shelly Cashman Series) by Gary B. Shelly and Misty E. Vermaat

2. Fundamentals of Computer Algorithms by Ellis and Sartaj Sahni Horowitz
3. Introduction to Algorithms, Second Edition by Thomas H. Cormen
4. Programming in ANSI C by Stephen G. Kochan

PREREQUISITES:
None