Study Program: Informatics

Type and level of studies: Bachelor studies

Course name: Object-oriented programming

Lecturer: Spalević Lj. Petar

Status: Compulsory

ECTS: 7

Attendance Prerequisites: Algorythms and Data Structures.

Course aims

The aim of the course is to enable students to write programs using C++ and advanced programming techniques.

Course outcome

The students are able to write programs using C++ programming language.

Course content

Theoretical part

Basic elements of C++ program. Non-object-oriented concepts of C++ language. Data types, operators, expressions and commands in C++ language. Functions in C++ language. Code extensions of C++ functions in relation to C functions. Principles of object-oriented programming. Data hiding. Code reuse. Classes in the C++ programming language. Defining classes and objects. Methods and friendly functions. Joint class members. Constructors and destructors. Operator functions. Inheritance in C++ programming language. Derived classes. Virtual methods. Abstract classes and methods. Exceptions in the C++ programming language. The notion of exception. Handling of exceptions. Generic functions and classes in C++. Defining templates. Generating functions and classes. Standard class library in C++. Value transfer (subroutine parameters and return value): by value, by pointer, by lvalue reference, by rvalue reference. Input stream flow operations. Overloading of extraction operator. Output stream flows. Using the insertion operator. Output formatting. Output stream flow operations. Overloading of insert operator for user types. Algorithms: for searching, modifying, sorting, heap operations. Timing. OOP projecting, projecting stages.

Practical part

Functions, dynamic allocation of memory and structure in C ++ programming languages. Dynamically linked lists in C ++ programming language. Header Files. Classes in the C++ programming language. Defining classes and objects. Friendly classes and functions. Joint class members. Constructors and destructors invitation. Separating the interface from the implementation. Operator functions. Operator overload. Operator functions. Generalization and specialization (performance and inheritance). Derived classes. Multiple inheritance. Visibility and access rights. Virtual methods. References and pointers. Abstract classes and methods. Exceptions in the C++ programming language. The notion of an exception. Handling of exceptions. Generic mechanisms-templates. Standard Template Library (STL). Classes and operations of the input stream flow. Output stream flow operations. Working with text and binary data streams.

Literature

1. Л. Краус, **Програмски језик C са решеним задацима**, пето издање, Академска мисао, Београд, 2004.
2. Л. Краус, **Решени задаци из програмског језика C**, Академска мисао, Београд, 2004.
3. Л. Краус, **Програмски језик C ++ са решеним задацима**, пето издање, Академска мисао, Београд, 2003.
4. М. Станковић, С. Стојковић, М. Радмановић и И. Петковић, Објектно оријентисани језици Ц++ и Јава – са решеним задацима, Електронски факултет у Нишу, Едиција Помоћни уџбеници, 2005.

Number of active classes	Lectures: 2	Practical classes: 3

Teaching methods

Lectures, calculation exercises, laboratory exercises, consulting, term papers, homework, written exam.

Assessment (maximum 100 points)

Course assignments	**points**	Final exam	**points**
activity during lectures	**10**	written exam	**20**
practical classes	**20**	oral exam	**25**
term test(s)	**25**		
seminar(s)			
Total:	**55**		**45**