

# PROGRAMMING AND APPLICATION OF COMPUTER SYSTEMS

Faculty of Structural Engineering, UACEG-Sofia

I semester - 2014/2015

## LIST OF EXAMINATION TOPICS

THEME 1. Basic concepts of informatics and programming. Algorithms – classification and description.

THEME 2. Programming languages. Classification. Integrated Development Environments (*IDE*).

THEME 3. Computer hardware – main devices and interaction between them.

THEME 4. Operating systems (OS) – definition, functions, and components. *MS Windows*.

THEME 5. C++ Programming. Basic elements of the language C++.

THEME 6. Data types. Variables, constants. Local and global variables.

THEME 7. Arrays. Declaration and usage. Accessing the values of an array.

THEME 8. Strings in C++. Definition and initialization. Manipulating strings.

THEME 9. Operations in C++. Precedence and associativity. Arithmetic operations.

THEME 10. Relational and logical operations. Examples.

THEME 11. The assignment operation. Modifications. Type conversion.

THEME 12. The conditional statement *IF* – modifications and application.

THEME 13. The *SWITCH* statement. Definition and application.

THEME 14. *WHILE* and *DO-WHILE* loop statements. Application and examples.

THEME 15. The statement *FOR*. Examples. Application of *FOR* in programs with arrays.

THEME 16. Operators *GOTO*, *CONTINUE*, *BREAK*, and *RETURN*. Definition.

THEME 17. Pointers – definition and functions. Operations with pointers.

THEME 18. Pointers and arrays. Application and examples.

THEME 19. *STRUCT* – declaration. Accessing the fields of a *STRUCT*. Application.

THEME 20. Functions in C++. Declaration, definition. Passing arguments by value.

THEME 21. Functions. Passing arguments by address.

THEME 22. Passing arrays as arguments in functions. Recursive functions.

THEME 23. Functions with default arguments. Passing a structure as function argument.

THEME 24. Introduction to C++ classes and objects. Declaration, definition. Object-oriented programming (OOP).

THEME 25. Access to class members. Options.

THEME 26. Input/Output with files. IOSTream library in C++. Main operations with files.