

UNIVERSITY OF ECONOMICS - VARNA
MASTER DEGREE CENTER
DEPARTMENT OF INFORMATICS

Adopted by the FC (record №8 / 05.03.2020)

Adopted by the DC (record №7 / 28.02.2020)

ACCEPTED BY:

Dean:

(Prof. Vladimir Sulov, PhD)

SYLLABUS

SUBJECT: "OBJECT-ORIENTED PROGRAMMING"

DEGREE PROGRAMME: „Computer Science”; MASTER'S DEGREE

YEAR OF STUDY: 6; SEMESTER: 11; (for other fields graduates)

TOTAL STUDENT WORKLOAD: 150 hours; incl. curricular 60 hours

CREDITS: 5

DISTRIBUTION OF STUDENT WORKLOAD ACCORDING TO THE CURRICULUM

| <i>TYPE OF STUDY HOURS</i> | WORKLOAD, hours | TEACHING HOURS PER WEEK, hours |
|-----------------------------|----------------------------|-----------------------------------------------|
| CURRICULAR: | | |
| incl. | | |
| • LECTURES | 30 | 2 |
| • SEMINARS / LAB. EXERCISES | 30 | 2 |
| EXTRACURRICULAR | 90 | - |

Prepared by:

1.
(Assoc. Prof. Pavel Petrov, PhD)

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I. ANNOTATION

The course "Object-Oriented Programming" provides knowledge about modern concept of modeling real-world objects through programming code. As a result of the training, students need to understand how encapsulation of data, abstraction, inheritance and polymorphism allows better reuse of programming code, better support and ability to extend the functionality of applications.

In the applied aspect knowledge and skills students acquire through one of the established in the practice object-oriented programming language. Its study allows in-depth to explore the ba-sics of object-oriented programming.

The course aims to provide expertise in the areas of software development; the students should acquire practical programming skills and knowledge how to use standard object-oriented programming libraries.

II. THEMATIC CONTENT

| № | TITLE OF UNIT AND SUBTOPICS | NUMBER OF HOURS | | |
|--------------------------------------------------------|-------------------------------------------------------------|-----------------|-----------|------|
| | | L | S | L.E. |
| Theme 1. Object-oriented design and programming | | 2 | 1 | |
| 1.1 | Concept for creating object-oriented applications. | | | |
| 1.2 | Main stages in the creation of object-oriented application. | | | |
| Theme 2. Classes and Objects | | 10 | 10 | |
| 2.1 | Class definition. Methods and properties. | | | |
| 2.2 | Interface and implementation. | | | |
| 2.3 | Constructor. Destructor. Objects initialization. | | | |
| 2.4 | Passing objects as arguments to functions. | | | |
| 2.5 | Creating and using dynamic objects. | | | |
| Theme 3. Encapsulation | | 4 | 5 | |
| 3.1 | Modes of access to members of the class. | | | |
| 3.2 | Static members. Pointer this. | | | |
| Theme 4. Inheritance | | 8 | 6 | |
| 4.1 | Redefining members. | | | |
| 4.2 | Virtual functions. | | | |
| 4.3 | Polymorphism. | | | |
| 4.4 | Abstract classes. | | | |
| Theme 5. Advanced object-oriented techniques | | 6 | 8 | |
| 5.1 | Exceptions. Throwing and catching exceptions | | | |
| 5.2 | Standard Libraries. Containers. Iterators. Algorithms. | | | |
| Total: | | 30 | 30 | |

III. FORMS OF CONTROL:

| № | TYPE AND FORM OF CONTROL | Number | extracurricular, hours |
|-----------|--------------------------------------------------------------------|---------------|-------------------------------|
| 1. | Midterm control | | |
| 1.1. | Programming test | 1 | 25 |
| 1.2. | Programming project related to the topics discussed in this course | 1 | 25 |
| | Total midterm control: | | 50 |
| 2. | Final term control | | |
| 2.1. | Test | 1 | 40 |
| | Total final term control: | 1 | 40 |
| | Total for all types of control: | 3 | 90 |

IV. LITERATURE

REQUIRED (BASIC) LITERATURE:

1. Bjarne Stroustrup, Programming: Principles and Practice Using C++ (2nd Edition), Addison-Wesley, 2014.
2. Green, D., et al. The C++ Workshop, Packt Publishing, 2020.
3. The C++ Resources Network - <http://www.cplusplus.com/>

RECOMMENDED (ADDITIONAL) LITERATURE:

1. Butler, M. Exploiting Modern C++, Addison-Wesley Professional, 2020.
2. Google's C++ Class - <https://developers.google.com/edu/c++>
3. Stanley B. Lippman, Josée Lajoie, Barbara E. Moo, C++ Primer (5th Edition), 2015.
4. Quinn, R. Advanced C++ Programming Cookbook, Packt Publishing, 2020.