

Course title: Advanced object programming		
Field of study: Computer science	Type of studies: Full-time	Course code:
Course characteristics: Mandatory	Level of studies: First	Year: 3 Semester: 6
Form of classes: lectures, laboratories	Hours per week: 2 lect, 2 lab written exam	Credits: 6 ECTS

COURSE GUIDE

GENERAL INFORMATION OF THE COURSE

AIMS OF THE COURSE

A1. Teaching students the advanced object programming in modern C++ (C++11).

PREREQUISITES

1. English language at the intermediate level at least.
2. Object programming and C++ language skills at the intermediate level at least.

LEARNING OUTCOMES (EFFECTS OF EDUCATION)

EE 1 A student can do the advanced object programming in modern C++.

COURSE PROGRAM

Lectures		Hours
L1-5	Memory model and type system (value categories of expressions, reference types, lifetime and storage duration, storage reuse, scalar objects, implicit conversions, dangling references, immutable objects)	5
L6-10	Object construction (object materialization, in-class initializers, explicit constructors, memberwise initialization, initializer-list constructors, delegating constructors, static member initialization, copy and move constructors, copy elision, generating default operations)	5
L11-15	Operators (operators in namespaces, explicit conversion operators, conversion ambiguities, user-defined literals, lambda expressions, polymorphic lambdas)	5
L16-20	Derived classes (virtual, override, and final member functions, inheriting constructors, return type relaxation)	5
L21-25	Class hierarchies (multiple interfaces, multiple implementation classes, ambiguity resolution, repeated use of a base class, virtual base classes, replicated vs. virtual bases)	5
L26-30	Class hierarchy navigation (dynamic cast, multiple inheritance, static_cast and dynamic_cast, recovering an interface, double dispatch and visitors, construction and destruction, type identification, extended type information)	5
Laboratory classes		Hours
L1-5	Exercises related to the memory model and type system	5
L6-10	Exercises related to the object construction	5
L11-15	Exercises related to the operators	5
L16-20	Exercises related to the derived classes	5
L21-25	Exercises related to the class hierarchies	5
L26-30	Exercises related to the class hierarchy navigation	5

DIDACTIC TOOLS

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| 1. – lectures |
| 2. – exercises solved by students during laboratory classes |
| 3. – written exam |

BASIC AND SUPPLEMENTARY LITERATURE

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| 1. Scott Meyers, Effective Modern C++, O'Reilly, 2014 |
| 2. Bjarne Stroustrup, The C++ Programming Language, Addison-Wesley, 2013 |
| 3. The standard of the C++ language |

TEACHER (NAME, SURNAME, E-MAIL)

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