

FACULTY of **Computer Science and Management**/ DEPARTMENT**SUBJECT CARD****Name in Polish:** Programowanie Obiektowe**Name in English:** Object Oriented Programming**Main field of study (if applicable):** Informatics**Specialization (if applicable):****Level and form of studies:** 1st/ ~~2nd~~* level, full-time / ~~part-time~~***Kind of subject:** obligatory / ~~optional~~ / ~~university-wide~~***Subject code** INZ000260W1**Group of courses** YES / ~~NO~~*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	60		90		
Form of crediting	Examination / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*
For group of courses mark (X) final course	X				
Number of ECTS points	2		2		
including number of ECTS points for practical (P) classes	0		2		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Programming skills at a basic level
2. Basic knowledge related to data structures and algorithms

SUBJECT OBJECTIVES

C1.Acquainting students with the object-oriented programming paradigm

C2 Acquainting students with libraries that support object-oriented programming

C3 Acquisition of skills to write programs in accordance with object-oriented programming paradigm

C4 Acquisition of skills to use libraries that support object-oriented programming paradigm

C5 Acquisition of the ability to apply the principles of health and safety work

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knows the mechanisms related to object-oriented programming

PEK_W02 Knows libraries that support object-oriented programming

relating to skills:

PEK_U01 Is able to write programs using object-oriented programming paradigm

PEK_U02 Is able to use libraries that support object-oriented programming

PEK_U03 Is able to use the principles of safety and health at work

relating to social competences:

PEK_K01...

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Object oriented programming paradigm. Object oriented programming languages. Object oriented fundamentals in C++.	2
Lec 2	The basic differences between C and C++ languages. Class definition (attributes and methods). Constructors.	2
Lec 3	Friend functions and classes. Function and operator overloading.	2
Lec 4	Aggregation, references and pointers to objects.	2
Lec 5	Inheritance, multiple inheritance and virtual inheritance, pointers of base classes.	2
Lec 6	Polymorphism and its implementation in C++ - virtual functions.	2
Lec 7	Dynamic creation of objects and virtual destructors. Arrays of objects.	2
Lec 8	Abstract data types, abstract classes.	2
Lec 9	Exception handling in C++	
Lec 10	Generic Functions (function templates).	2
Lec 11	Generic classes (class templates).	2
Lec 12	Container class templates - sequence containers (vector, double-ended queue (deque), list), adaptors containers (LIFO stack, FIFO queue, priority queue) – STL library - iterators	2
Lec 13	Container class templates - associative containers: Set, multiset, map, multimap, bitset – STL library	2
Lec 14	Test	2
Lec 15	The functionalities offered by the <i>boots</i> library	2
	Total hours	30
Form of classes - class		Number of hours
Cl 1		
Cl 2		
..		
	Total hours	
Form of classes - laboratory		Number of hours
Lab1	Presentation of laboratory scope, presentation of grading	2

	principles, training from health and safety at work. Familiarization with laboratory programming environment.	
Lab2	C language repetition - elementary syntactic construction in C using I/O console	2
Lab3	Simple class definition and implementation in C++	2
Lab4	Advanced class definition and implementation in C++ (constructors, overloaded I/O operations, etc.)	2
Lab5	Implementation of programs that uses aggregation and pointers to objects	2
Lab6	Implementation of programs that uses inheritance	2
Lab7	Implementation of programs that uses multiply inheritance	2
Lab8	Implementation of programs that uses virtual function	2
Lab9	Complete implementation of own data type	2
Lab10	Implementation of programs that uses exemption handling	
Lab11	Implementation of programs that uses template functions	2
Lab12	Implementation of programs that uses template classes	2
Lab13	Implementation of programs that uses sequence containers or container adaptors.	2
Lab14	Implementation of programs that uses associative containers	2
Lab15	Use of the STL library components, analysis of time and memory efficiency on selected examples	2
	Total hours	30
Form of classes - project		Number of hours
Proj1		
Proj2		
...		
	Total hours	
Form of classes - seminar		Number of hours
Sem1		
Sem2		
...		
	Total hours	
TEACHING TOOLS USED		
N1. Lecture supported by multimedia presentations (slideshow) N2. MSVC – the development environment N3. STL library		

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1 – (lecture)	PEK_W01	Quizzes and test during the

	PEK_W02	lecture, student activity during the lecture, students answering on questions during lecture
F2 – (laboratory)	PEK_U01 PEK_U02 PEK_U03	Checking of student preparation for exercise realization, evaluation of the quality of submitted by students programs, implementation during the laboratory additional tasks formulated during the laboratory (on-line programming)

P - the final grade will be issued on the basis of partial grades (points) received from the test (T), quizzes (Q) and evaluation of F2 as follows:

$$\text{Grade} = 40\% * T + 10\% * Q + 50\% * F2$$

In order to receive a positive grade from each activity is required to obtain at least 40% of the points.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] B. Stroustrup, The C++ Programming language, Addison-Wesley Pub. 1993
- [2] H.M. Deitel, P.J. Deitel, C++ How to program, Prentice Hall 2003
- [3] B. Eckel, Thinking in C++, Pearson Education 2000.
- [4] Documentation of the STL library

SECONDARY LITERATURE:

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR
SUBJECT
Object Oriented Programming
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Informatics
AND SPECIALIZATION

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01 (knowledge)	K1INF_W05, K1INF_W06	C1	Lec1 – Lec11, Lec14	N1
PEK_W02	K1INF_W05, K1INF_W06	C2	Lec10 -Lec13, Lec14, Lec15	N1
PEK_U01 (skills)	K1INF_U02	C3	Lab1 – Lab12	N2
PEK_U02	K1INF_U02	C4	Lab13 – Lab15	N2,N3
PEK_U03	K1INF_U14	C5	Lab1 – Lab15	N2,N3
PEK_K01 (competences)				

** - enter symbols for main-field-of-study/specialization educational effects

*** - from table above