SYLLABUS

Name: ***Computer Programming (InfAAu>SI2CP19)***
Name in Polish:
Name in English: ***Computer Programming 2***

Information on course:

Course offered by department: Faculty of Automatic Control, Electronics and Computer Science
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://platforma2.polsl.pl/rau2/course/view.php?id=932

Short description:

The main subject of the lecture and laboratory classes is object-oriented programming with the use of the C ++ language

Description:

The objective of the course is to provide knowledge necessary to understand the design and implementation of programs as well as the skills to implement the software on the example of the C++ language. The aim of the course is to create strong theoretical and practical foundations in the field programming paradigms: structural and object-oriented. The laboratory and the project allow to apply in practice the knowledge acquired during lectures, including knowledge necessary to create software, in particular concerning basic and advanced object-oriented techniques on the example of the C++ language (object-oriented analysis, design, and programming).

Lecture topics: Object-oriented techniques on the example of the C++ language. Paradigm of object-oriented programming, abstract data types. Classes, objects, life cycle of objects. Operator overloading. Inheritance. Polymorphism. Run time type information. Abstract classes. Multiple inheritance. The mechanism of exceptions. Templates. The C++ standard library, the input/output library. The generic programming; The STL library, containers, iterators and algorithms. Smart pointers. Parallelism.

Laboratory topics: Classes, constructors, and destructors. Operator overloading. Inheritance and multiple inheritance. Polymorphism.

ECTS: 4
Total workload: 100 hours (50 contact hours, 50 students' own work hours)
lectures – 30
laboratory classes – 15
other (discussion of tasks and the semester's programming task) - 5
student's own work (preparation for thematic tasks, completion of tasks and work on the semester programming task)

Bibliography:

Basic sources:
- B. Stroustroup, Programming: Principles and Practice Using C++ (in Polish: Programowanie. Teoria i praktyka z wykorzystaniem C++)
- B. Stroustrup, The C++ Programming Language (in Polish: Język C++)
- ISO/IEC JTC1/SC22/WG21 International Standard—Programming Languages C++

Additional:
- Nicolai M. Josuttis: The C++ Standard Library: A Tutorial and Reference, 2nd Edition (in Polish: C++ Biblioteka standardowa Podręcznik Programisty, wydanie 2)
- Gręboszz J.: Symfonia C++. RM, W-wa, wyd. 4 (in Polish only)
- Gręboszz J.: Pasja C++. RM, W-wa, wyd. 2 (in Polish only)

Learning outcomes:

Student can apply a selected object-oriented programming techniue (test) K1A_U23
Student can complete a task illustrating the properties of a selected object-oriented programming technique (laboratory task) K1A_U23
Student can design a class hierarchy and data structures for a simple programming task (project) K1A_U26
Student can, under the object-oriented programming paradigm, make a complete, simple programming task using techniques such as inheritance, operator overloading, stream/file operations, dynamic memory, and polymorphism (project) K1A_U26 K1A_U23
Student can prepare documentation for the completed programming task (project report) K1A_U26

The student knows and understands the object-oriented programming paradigm (project) K1A_W09
The student knows and understands the meaning of class and object, and the possibilities offered by object-oriented data types (project) K1A_W09 K1A_W15
The student knows and understands the basic and intermediate object-oriented programming techniques such as inheritance, operator overloading, and polymorphism (test) K1A_W11 K1A_U18

Assessment methods and assessment criteria:

Laboratory and lecture: obtaining at least half of the obtainable points is required for results in each category: thematic tasks and programming project, test.

Laboratory tasks are graded on a scale of 0-5 points, the project 0-15 points, and the test 0-10 points.

points grade
[15 – 18) 3.0
[18 – 21) 3.5
[21 – 24) 4.0
[24 – 27) 4.5
[27 – 30] 5.0

The syllabus is valid from the academic year 2025/2026, and its content is not subject to change during the semester.

Practical placement:
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Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	4	2020/2021-Z	