POZNAN UNIVERSITY OF TECHNOLOGY

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Object oriented programming [N2Eltech2>PO2]

Course

Field of study	Year/Semester
Electrical Engineering	1/2
Area of study (specialization)	Profile of study
Power Networks and Electric Power Systems Protection	general academic
Level of study	Course offered in
second-cycle	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other
0	20	0

Tutorials	Projects/seminars
0	0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

A student beginning this course should have basic knowledge of computer science and programming. Additionally, he or she should have abstract thinking skills, be able to acquire information from indicated sources and show readiness to cooperate in a team.

Course objective

To teach students theoretical and practical issues of high-level programming with elements of object-oriented programming, to acquire skills to create applications in Microsoft Visual Studio environment (in C# language). Developing students' skills of solving problems that occur during design and implementation of technical applications.

Course-related learning outcomes

Knowledge:

The student knows the principles of high-level programming. The student has knowledge of object-oriented programming, which is useful in creating technical applications.

Skills:
The student is able to use tools for programming with the use of object-oriented programming elements. The student is able to program in the C# language.

Social competences:
Awareness of the speed of development of information technology and the related need to update knowledge. Is able to independently search for information in literature and Internet, also in foreign languages.

Methods for verifying learning outcomes and assessment criteria
Learning outcomes presented above are verified as follows:

The skills acquired during the laboratory classes are verified on the basis of a credit test or on the basis of a project application performed by the student, taking into account the individual activity during the classes. Obtaining additional points for the activity during the classes (especially for: discussing additional aspects of the problem; the effectiveness of applying the knowledge gained in solving the problem; the ability to cooperate as part of a team practicing the specific task in the laboratory; comments related to the improvement of teaching materials; diligence)

Programme content
Implementation in Visual Studio C# Express Edition environment of the issues presented in the lecture in practical object-oriented programs using the following programming elements: declarations of object types, fields and methods, readonly fields, static elements, constructors and destructor, properties, method overloading, operator overloading, encapsulation, inheritance, polymorphism and its use, abstract classes and methods, use of collections of various types, use of delegates and interfaces, programming applications using multiple threads, implementation of selected design patterns.

Course topics

1. organizational classes, discussion of the environment.

2. Basic value types, function declarations, loops, creating graphs.

3. enumeration type, explicit and implicit conversion, params.

4-6. class and object creation, properties, methods, fields, encapsulation.

7. Constructors, destructor, operator, static elements.
8-9. inheritance and polymorphism, protected.

10. collections and Tuples.

11-12. delegates, interfaces, complementary material elements.

13. multithreaded work.

14. design pattern.

15. credit colloquium.

Teaching methods
Individual work in the computer laboratory, involving the implementation of assigned functions and computer programs, discussion, demonstrations.

Bibliography

Basic:

1. Troelsen, Andrew; Japikse, Phiplip. Język C# 6.0 i platforma .NET 4.6. Red. . Warszawa: Wydawnictwo Naukowe PWN, 2017, 1465 s. ISBN 978-83-01-19832-9
2. Chłosta, Paweł. Aplikacje Windows Forms .Net w C#. Red. . Warszawa: Wydawnictwo Naukowe PWN, 2006, 318 s. ISBN 83-01-14830-6
3. Rodenburg, Jort. Koduj jak profesjonalista C#. Red. . Warszawa: Promise, 2022, 466 s. ISBN 978-83-7541-459-2
4. Trey Nash, Accelerated C# 2010, Apress, 2010
5. C# language specification: https://github.com/dotnet/csharplang/tree/main/spec

Additional:

1. Sharp, John. Microsoft Visual C# 2017 Krok po kroku. Red. . Warszawa: Promise, 2019, 937 s. ISBN 978-83-7541-362-5
2. Stasiak, Andrzej; Dąbrowski, Włodzimierz; Wolski, Michał. Modelowanie systemów informatycznych w języku UML 2.1. Red. . Warszawa: Wydawnictwo Naukowe PWN, 2009, 196 s. ISBN 978-83-01-21108-0

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	20	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00