COURSE DESCRIPTION CARD - SYLLABUS

Course name
Object oriented programming [S2Eltech1E>PO1]

Course

Field of study
Electrical Engineering

Year/Semester
1/1

Area of study (specialization)
Electrical Systems in Industry and Vehicles

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

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:

Knowledge acquired during the lecture is verified during the lecture test consisting of 15-20 questions (closed and open), scored according to their difficulty. The pass mark is 50%. Issues on which the questions are based will be given during the lecture or made available to students in the "eCourses" system.

Programme content

Theoretical presentation of basic object-oriented programming issues, Visual Studio C# Express Edition environment, problems of representing physical reality in data structures, modeling of relationships between objects, declarations of object types, fields and methods, readonly fields, static elements, constructors and destructor, properties, method overloading, operator overloading, encapsulation, inheritance, polymorphism and its application, abstract classes and methods, using collections of various types, delegates and interfaces, multithreading of applications, presentation 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

Multimedia presentation, illustrated with examples given on the blackboard and computer animations, initiating discussion during the lecture. Additional materials are placed in the "eCourses" system.

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	30	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	0,50