

# Object-oriented programming - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Object-oriented programming
Kod przedmiotu	06.9-ZiIP-ANG-D-08_20
Wydział	<a href="#">Wydział Mechaniczny</a>
Kierunek	Management and Production Engineering
Profil	ogólnoakademicki
Rodzaj studiów	drugiego stopnia z tyt. magistra inżyniera
Semestr rozpoczęcia	semestr zimowy 2020/2021

Informacje o przedmiocie	
Semestr	1
Liczba punktów ECTS do zdobycia	3
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	<ul style="list-style-type: none"><li>dr inż. Grzegorz Pająk</li><li>dr inż. Iwona Pająk</li></ul>

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Ćwiczenia	15	1	9	0,6	Zaliczenie na ocenę
Laboratorium	15	1	9	0,6	Zaliczenie na ocenę
Wykład	15	1	9	0,6	Zaliczenie na ocenę

## Cel przedmiotu

Familiarize with the object-oriented approach to system analysis and design, developing skills in using a modern programming environment to creation of simple elements of the IT system.

## Wymagania wstępne

Computer skills.

## Zakres tematyczny

### Lecture

Reminder of the basic concepts: algorithm, programming language, low level language, high level language, programming, program. Basic information about object-oriented programming, VBA objects in Excel. Analysis of a simple function created in the VBA environment.

Basic elements of the object model. The object as an element of the real world and its model. Object components: attributes and methods. Object classes. Object-oriented approach to system description. Analysis of the object-oriented application model in VBA. Implementation of the sample program using objects available in the VBA environment.

Modules, procedures and functions. Passing parameters by value and reference. Using the exception mechanism to handle errors in the program.

Object-event model of the program. The used of objects events to automate operations carried out in the application.

Class form modules. Class definition syntax. Definition of fields and properties. Definition of procedural and functional methods. Method arguments passed by value and reference. The process of creating and removing objects. References to objects and their components. Design, implementation and testing of an example class. Creating add-ons

### Exercises

Example function in a VBA environment. Selected Excel objects, property references. Assignment instruction, arithmetic operators, standard functions.

References to data , performing calculations and displaying results in Excel worksheets cells. Using the exception handling mechanism to catch errors in the designed programs.

Modules, procedures and functions. Passing parameters by value and reference.

Form class structure, fields and methods. Defining procedural and functional methods. Passing parameters by value and reference, examples of applications. Creating and deleting objects.

### Laboratory

Introduction to VBA in Excel. Creating macros using the recording mechanism. Creating toolbars with an individual set of functions. Analysis of the macro codes. Creating your own modules containing functions that perform simple calculations.

Form controls in VBA, user interface design, properties window, event definition.

Implementation of programs based on tasks completed as part of the exercises:

- functions that perform calculations with error handling using the exception handling mechanism,
- creating own modules with a set of procedures and functions,
- definition of own class to solve a sample problem,
- creating add-ons.

## Metody kształcenia

*Lecture:* a conventional lecture

*Exercises:* problem tasks, case analysis, individual work

*Laboratory:* practical classes in the computer laboratory

## Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student is able to interact and work in a group accepting various roles	<ul style="list-style-type: none"><li>• <a href="#">K_K03</a></li></ul>	<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li><li>• przygotowanie projektu</li></ul>	<ul style="list-style-type: none"><li>• Laboratorium</li><li>• Ćwiczenia</li></ul>
The student has detailed knowledge of selected issues of Mechanical Engineering, as broadly understood and associated with Production Engineering and computer-aided management.	<ul style="list-style-type: none"><li>• <a href="#">K_W06</a></li><li>• <a href="#">K_W09</a></li></ul>	<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li><li>• kolokwium</li></ul>	<ul style="list-style-type: none"><li>• Wykład</li><li>• Ćwiczenia</li></ul>
The student is able to think and act both creatively and entrepreneurially.	<ul style="list-style-type: none"><li>• <a href="#">K_K06</a></li></ul>	<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li></ul>	<ul style="list-style-type: none"><li>• Laboratorium</li><li>• Ćwiczenia</li></ul>
The student can work individually as well as in a team; he/she is also able to select team members for a specific task and assign tasks to the members and manage a small team.	<ul style="list-style-type: none"><li>• <a href="#">K_U03</a></li></ul>	<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li></ul>	<ul style="list-style-type: none"><li>• Laboratorium</li><li>• Ćwiczenia</li></ul>
The student is able to obtain information from literature, databases and other sources and is able to integrate, interpret and critically evaluate it, as well as draw conclusions, therefrom, both formulating it and sufficiently justify opinions on it.	<ul style="list-style-type: none"><li>• <a href="#">K_U01</a></li></ul>	<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li><li>• kolokwium</li><li>• przygotowanie projektu</li></ul>	<ul style="list-style-type: none"><li>• Wykład</li><li>• Laboratorium</li><li>• Ćwiczenia</li></ul>

## Warunki zaliczenia

*Lecture:* a positive result of the assessment via a written test

*Exercises:* a positive final assessment, based on grades from tests and oral answers

*Laboratory:* a positive result of the assessment based on final test

*Final rating:* the arithmetical mean of grades from individual types of classes.

## Literatura podstawowa

1. DeMarco J., Pro Excel 2007 VBA, Springer, 2008,
2. Kofler M., Definitive Guide to Excel VBA, Springer, 2003,
3. Morgado F., Programming Excel with VBA, Springer, 2016,
4. Walkenbach J., Excel Vba Programming For Dummies, John Wiley & Sons; 4 edition, 2015.

## Literatura uzupełniająca

1. Booch G., Rumbaugh J., Jacobson I., The Unified Modeling Language User Guide, Addison-Wesley Professional, 2 edition, 2005,
2. Walkenbach J., Excel 2013 Bible, Wiley, 1 edition, 2018

## Uwagi

Zmodyfikowane przez dr inż. Grzegorz Pająk (ostatnia modyfikacja: 27-04-2020 11:40)

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