KARTA PRZEDMIOTU

I. Dane podstawowe

Nazwa przedmiotu	Fundamentals of algorithms and programming
Nazwa przedmiotu w języku angielskim	Fundamentals of algorithms and programming
Kierunek studiów	Informatics
Poziom studiów (I, II, jednolite magisterskie)	I
Forma studiów (stacjonarne, niestacjonarne)	Full-time studies
Dyscyplina	Informatics
Język wykładowy	English

Koordynator przedmiotu/osoba odpowiedzialna	Michał Dolecki, PhD

Forma zajęć *(katalog zamknięty ze słownika)*	Liczba godzin	semestr	Punkty ECTS
lecture	30	I	6
laboratory	30	I	

Wymagania wstępne	Introduction to computer science. Basic programming skills.

II. Cele kształcenia dla przedmiotu

Deepening the basic knowledge of C++.
Presentation of the sorting and the searching algorithms
Introduction to the basics of object-oriented programming

III. Efekty uczenia się dla przedmiotu wraz z odniesieniem do efektów kierunkowych

Symbol	Opis efektu przedmiotowego	Odniesienie do efektu kierunkowego
WIEDZA		
W_01	The student knows how to define two-dimensional arrays and how to write functions that operate on them.	K_W03, K_W06
W_02	The student knows the operating principles and construction of recursive functions.	K_W06
W_03	The student knows the method of defining structures and examples of their use.	K_W01, K_W06
W_04	The student knows the methods to read and write data to a file.	K_W06
W_05	The student knows how to define a simple class: its fields, constructors and methods.	K_W01
W_06	The student knows the definitions of the enumeration type.	K_W03
W_07	The student presents the basic sorting and searching algorithms.	K_W01, K_W03, K_W06
UMIEJĘTNOŚCI		
U_01	The student can write more advanced programs.	K_U02, K_U04, K_U07, K_U08, K_U09, K_U11, K_U12, K_U17
U_02	The student is able to create a functions that operate on the multidimensional arrays, select parameters and determine the result of the function.	K_U02, K_U04, K_U11
U_03	Student is able to create a recursive function for the given problem, can predict the result of the recursive function.	K_U02, K_U04, K_U09
U_04	Student is able to define a structure and a simple class, write a program that operates on the structures and on the simple classes, and uses previously created functions.	K_U02, K_U04, K_U11, K_U12
U_05	The student can read and write data to a file.	K_U02, K_U04, K_U11
U_06	The student can use the enumeration type.	K_U04
KOMPETENCJE SPOŁECZNE		
K_01	The student is able to formulate a solution to the given problem, is open to the new solutions	K_K01
K_02	The student solves the given problems individually and while working in a group.	K_K02

IV. Opis przedmiotu/ treści programowe

Two-dimensional arrays.
Recursive functions.
Basic sorting and searching algorithms.
The use of the recursion in sorting algorithms.
Input / output operations on files.
Structures, arrays of structures.
Classes and introduction to object-oriented programming. Class definition, fields, methods, constructors and destructors.
Enumeration type.

V. Metody realizacji i weryfikacji efektów uczenia się

Symbol efektu	Metody dydaktyczne *(lista wyboru)*	Metody weryfikacji *(lista wyboru)*	Sposoby dokumentacji *(lista wyboru)*
WIEDZA			
W_01	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_02	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_03	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_04	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_05	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_06	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
W_07	Conventional lecture / Guided practice	Exam/Written test	Examination card / written test
UMIEJĘTNOŚCI			
U_01	Practical classes	Exam/Written test	Examination card / written test
U_02	Practical classes	Exam/Written test	Examination card / written test
U_03	Practical classes	Exam/Written test	Examination card / written test
U_04	Practical classes	Exam/Written test	Examination card / written test
U_05	Practical classes	Exam/Written test	Examination card / written test
U_06	Practical classes	Exam/Written test	Examination card / written test
KOMPETENCJE SPOŁECZNE			
K_01	Discussion, PBL (Problem-Based Learning)	Exam/Written test	Examination card / written test
K_02	Discussion, PBL (Problem-Based Learning)	Exam/Written test	Examination card / written test

VI. Kryteria oceny, wagi…

To pass a course, the student has to attend a classes and has to pass the tests and the final exam.

- passing classes - colloquia (two-dimensional arrays, recursive functions, structures, files) - 90% of the final grade, student's activity and work during classes - 10% of the final grade.

- written exam - for people who have passed the classes. The student may be discharged from the written part of the exam based on the result obtained on the exercises. Detailed conditions of exemption are given to students with each course edition.

Detailed assessment rules are given to the students with each edition of the course.

VII. Obciążenie pracą studenta

Forma aktywności studenta	Liczba godzin
Liczba godzin kontaktowych z nauczycielem	**90**
Liczba godzin indywidualnej pracy studenta	**60**

VIII. Literatura

Literatura podstawowa
B. Stroustrup, Programming Principles and Practice Using C++, 2nd ed., Addison-Wesley, Upper Saddle River, NJ, 2014 B. Stroustrup, A Tour of C++, Addison-Wesley, Upper Saddle River, 2013 B. Stroustrup, The C++ Programming Language, Addison-Wesley, Upper Saddle River, 2013 cplusplus.com (website)
Literatura uzupełniająca
N. Dale, Ch. Weems, M. Headington, Programming in C++, 2nd ed., Jones and Bartlett Publishers, Sudbury 2000. N. Dale, Ch. Weems, M. Headington, Programming and Problem Solving with C++, 2nd ed., Jones and Bartlett Publishers, Sudbury 1999. B. Eckel, Thinking in C++, Helion, Gliwice 2002. R. Sedgewick, K. Wayne, Algorithms, 4th ed., Addison-Wesley, Upper Saddle River, NJ, 2011. N. Wirth, Algorithms + Data Structures = Programs, Prentice-Hall 1976

Załącznik nr 5 do dokumentacji programowej