

KARTA PRZEDMIOTU**I. Dane podstawowe**

Nazwa przedmiotu	Abstract data structures
Nazwa przedmiotu w języku angielskim	Abstract data structures
Kierunek studiów	Informatics, Mathematics
Poziom studiów (I, II, jednolite magisterskie)	BA (1st level)
Forma studiów (stacjonarne, niestacjonarne)	Full-time studies
Dyscyplina	Informatics, Computer Science, Mathematics
Język wykładowy	English

Koordinator przedmiotu/osoba odpowiedzialna	dr Michał Dolecki
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Forma zajęć (<i>katalog zamknięty ze słownika</i>)	Liczba godzin	semestr	Punkty ECTS
wykład	30	IV (Inf & Mat)	5 (Inf & Mat)
konwersatorium			
ćwiczenia			
laboratorium	30	IV (Inf & Mat)	
warsztaty			
seminarium			
proseminarium			
lektorat			
praktyki			
zajęcia terenowe			
pracownia dyplomowa			
translatorium			
wizyta studyjna			

Wymagania wstępne	Object-oriented programming Basics of programming in Java
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II. Cele kształcenia dla przedmiotu

C1 - Presentation of the basic abstract data types
C2 - Own implementation of this types
C3 - Abstract data types in Java

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 the definition of the Abstract Data Type and knows the most commonly used Data Structures	K_W06
W_02	The student knows basic methods that manipulates ADS and their implementation	K_W03
W_03	The student knows the Java Collections Framework and the advantages of using a common API for ADS	K_W01
UMIEJĘTNOŚCI		
U_01	The student can use technical language related to the ADS concepts	K_U04
U_02	The student can use abstract data structures in application, implement own version of ADS and use frameworks or libraries with prepared implementation	K_U10, K_U11
U_03	The student can solve problems from various areas of sciences and real life using algorithms based on ADS	K_U08
U_04	The student can gain additional, helpful information from the technical documentation, help files, the Internet and available literature	K_U02
KOMPETENCJE SPOŁECZNE		
K_01	The student understands the need for further education	K_K01
K_02	The student can communicate and cooperate in professional environment	K_K07

IV. Opis przedmiotu/ treści programowe

Definition of the Abstract Data Type
 Array as an Abstract Data Type
 Basic ADTs:
 Stack and generic stack, implementation using arrays and references
 Queue and generic queue, implementation using arrays and references
 List and generic list, implementation using arrays and references
 Trees and generic Trees
 Implementation of binary tree
 Tree traversal
 ADS in Java - Collections Framework
 Java classes for Stack, List, ArrayList, LinkedList, Set and TreeSet

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 - Conversational lecture - Guided practice	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
W_02	- Conventional lecture - Conversational lecture - Guided practice	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
W_03	- Conventional lecture - Conversational lecture - Guided practice	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
UMIEJĘTNOŚCI			
U_01	- Practical classes - Group work	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
U_02	- Practical classes - Group work	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
U_03	- Practical classes - Group work	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
U_04	- Practical classes - Group work	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
KOMPETENCJE SPOŁECZNE			
K_01	- Discussion	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file
K_02	- Discussion	- Exam/Written test - Preparation / implementation of the project	- Examination card / written test - Protocol / report printout/ report file

Kryteria oceny, wagi...

- passing classes – written tests (20% of the final grade), activity and oral answers to the laboratories (10% of the final grade), home works (20% of the final grade) and colloquia (50% of the final grade).

- written exam - for people who have passed the classes. Assessment criteria: less than 50% of the final result - unsatisfactory

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

VI. Obciążenie pracą studenta

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

VII. Literatura

Literatura podstawowa
1. S. Gray, Data Structures in Java: From Abstract Data Types to the Java Collections Framework, Pearson 2006
2. M. T. Goodrich, Data Structures and Algorithms in Java, Wiley 2010
Literatura uzupełniająca
1. B. Eckel, Thinking in Java, Prentice Hall, 1998+
2. C. Horstmann, G. Cornell, Core Java 2, Volume I: Fundamentals, Prentice Hall, 1999+
3. C. Horstmann, Core Java, Volume II: Advanced Features, Prentice Hall, 1999+
4. https://docs.oracle.com/javase/tutorial/

