School of Business and Management Sciences / Management Information Systems (English)

2023 - 2024 Academic Year

ALGORITHMS and DATA STRUCTURES

Syllabus

Course Description						
Name		**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
ALGORITHMS and DATA STRUCTURES		MIS2210876	Spring Semester	2+0	2	4
Prerequisites Courses	PROGRAMLAMAYA GİRİŞ VE ALGORİTMALAR					
Recommended Elective Courses						
Language of Instruction	English					
Course Level	First Cycle (Bachelor's Degree)					
Course Type	Required					
Course Coordinator	Prof.Dr. Gökhan SİLAHTAROĞLU					
Name of Lecturer(s)	Lect. Nada A. M. MISK					
Assistant(s)						
Aim	To enable our students to recognize data structures, the basis that determines how the data is organized in computers, the data to be processed must be organized for an algorithm to be effective, understandable, and correct. In addition, it is essential to show how much time and memory are needed in the computer environment to operate a particular algorithm.					
Course Content	This course contains; General definitions and basic concepts of the course.,Data Models,General Review on C Programming Language,Enum, struct, union, typedef Structure,Stacks,Queue,Lists,Trees,Sorting Algorithms,Search Algorithms,Graphs,Shortest path Algorithm.,Storage management,Automatic List Management,Dynamic Memory Management.					

Course Learning Outcomes	**Teaching Methods**	**Assessment Methods**
1. will be able to recognize and use the basic concepts by making general definitions about Data Constructions.	16, 8, 9	A
1.1. Explains types of data structures.	6, 9	E
1.2. Distinguish different types of data structures.	10, 6, 9	
2. will be able to use general information about C Programming Language.	8, 9	A, E
2.1. Uses characteristics of C programming language.	10, 9	
2.2. Explains historical development process of C programming language.	16, 9	
3. will be able to recognize the stack	13, 9	A
3.1. Uses the properties of the stack.	8, 9	
3.2. Uses recursion.	9	E, F, H
4. will be able to recognize Queues and List Data Structures and use their properties.	8, 9	A, E
4.1. Defines queue and use its properties.	13, 16, 6, 8, 9	
4.2. Defines List Data Structure and uses its properties.	10, 16, 8, 9	
5. will be able to recognize and use tree data structure.	16, 6, 9	A, E
5.1. Applies tree structure.	10, 16, 6, 9	
5.2. Lists types of trees.	10, 16, 6, 9	
6. will be able to recognize and use sorting and search algorithms.	10, 16, 9	A, E
6.1. Lists sorting algorithms.	6, 8, 9	
6.2. Applies sorting algorithm.	16, 6, 8, 9	
6.3. Lists search algorithms.	16, 6, 9	
7. Will be able to recognize and use Warshall and Shortest Path Algorithms	12, 13, 16, 6, 8, 9	A, E
7.1. Uses Warshal algoritms.	6, 8, 9	E
7.2. Uses shortest path algorithms.	10, 16, 9	
8. Will be able to use the features Storage, List, Dynamic Memory Management	16, 8, 9	A, E
8.1. Defines Storage, List and Memory.	8, 9	E, F
8.2. Performs storage, list and memory operations.	16, 6, 8, 9	

Teaching Methods	10: Discussion Method, 12: Problem Solving Method, 13: Case Study Method, 16: Question - Answer Technique, 6: Experiential Learning, 8: Flipped Classroom Learning, 9: Lecture Method
Assessment Methods	A: Traditional Written Exam, E: Homework, F: Project Task, H: Performance Task

Lecture Schedule

Sequence	**Topics**	**Preliminary Preparation**
1	General definitions and basic concepts of the course.	
2	Data Models	
3	General Review on C Programming Language	
4	Enum, struct, union, typedef Structure	
5	Stacks	
6	Queue	
7	Lists	
8	Trees	
9	Sorting Algorithms	
9	Search Algorithms	
10	Graphs	
11	Shortest path Algorithm.	
12	Storage management	
13	Automatic List Management	
14	Dynamic Memory Management	

Evaluation Methods	**Weight(%)**
(Midterm Exam) Assignments / Homework as a part of midterm.	15 of 40% from Midterm

Midterm Exam	40
General Exam	60

Resources
Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles 5th ed. Edition Narasimha Karumanchi (Author)[1]All lecture notes available at http://mebis.medipol.edu.tr 2] Rifat Çölkesen, Veri Yapıları ve Algoritmalar, Papatya Bilim Yay. [3] Introduction to the Design and Analysis of Algorithms 3rd Edition, Anany Levitin (Author)