Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF224	Algorithms And Data Structures	3	3	0	2	3	4

Prerequisites	INF103
Admission Requirements	INF103

Language of Instruction	French
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	The main aim of the course is to enable the student to select the most suitable data structure for various data types, to use these data structures within algorithms, to perform performance analyzes of written algorithms and to encode data structures and related algorithms in a selected computer language. The course content can be summarized as follows: - Different types of data examples are shown to students, the differences are emphasized. - Ability to think of an algorithm as a function. - It is taught to compare two given algorithms in terms of performance. - Students learn to make different data structures in computer language. - Students learn to visualize data structures visually. - Students learn to use the data structures they learn in algorithms.
Content	Week 1: Algorithm analysis. Week 2: Principal data structures (arrays, linked lists, queues, stacks). Week 3: Tree structures, binary search tree, tree taversal Week 4: AVL tree, splay tree structure Week 5: Priority queue, heaps Week 6: Dynamic arrays, aggregate method Week 7: Disjoint sets Week 8: Hashing, hash tables, hash functions. Week 9: Midterm Week 10: Graph data structure. Week 11: Graph algorithms (shortest path, minimum spanning tree). Week 12: Search algorithms. Week 13: Sorting algorithms. Week 14: Coding algorithms.
References	1. M.A. Weiss, Data Structures & Algorithm Analysis in C++, 1999, Addison Wesley. 2. A.M. Tanenbaum, Data Structures using C, 1989, Prentice Hall. 3. A. Drozdek, Data Structures and Algorithmss in C++, 2004, Course Technology. 4. R. Sedgewick, Algorithms in C, Parts 1-4: Fundamentals, Data Structures, Sorting, Searching, 1997, Addison-Wesley. 5. Olcay Taner Yıldız, C && Java ile Veri Yapılarına Giriş, Boğaziçi University Press, 2013.

Theory Topics

Week	Weekly Contents
1	Overview, algorithm analysis
2	Principal data structures (arrays, linked lists, queues, stacks)
3	Tree structures, binary search tree, tree traversal
4	AVL tree, splay tree structure
5	Priority queue, heaps
6	Dynamic arrays, aggregate method
7	Disjoint sets
8	Hashing, hash tables, hash functions
9	Midterm
10	Graph data structure
11	Graph algorithms (shortest path, minimum spanning tree)
12	Searching algorithms
13	Sorting algorithms
14	Project presentations