University of Salahaddin-Hawler
Education College / Scientific Deps.
Computer Dept.

Course Book

Subject:

DATA STRUCTURES & Algorithims

Under Graduated Study / Second Stage
Academic Year / 2015 - 2016

lecturer :

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Office hours: Tuesday 10:30 – 11-30 or by appointment
Class hours: Tuesday 8:30 – 10:30 (group A)
Thursday 10:30 – 12:30 (group B)
Lab. Hours: Wednesdays 8:30 - 4:30

Course Description:

The course consists of two parts (theoretical and practical).And this will focus on algorithms, analysis, and the use of basic and advanced data structures. Among the specific data structures are covered strings, stacks, records, linked lists, trees and graphs. Recursion will also be covered. Sequential and random files, hashing and indexed sequential access methods for files will be discussed. Finally, some standard computer science algorithms (sorting and searching) will be discussed.

Language: English

Course Goals (Student Learner Outcomes):

The student should

- **Be able to use and implement fundamental data structures including stacks, queues, lists, trees and graphs.**
- **Learn to use recursion to solve problems.**
- **Implement/ utilize various data structures using a programming language such as C++.**
- **Learn various searching and sorting techniques.**
- **Learn about dynamic memory allocation**
- **Be stronger programmer**

And

- **To develop proficiency in the specification, representation, and implementation of Data Types and Data Structures.**
- **To get a good understanding of applications of Data Structures.**
- **To develop a base for advanced computer science study.**

Prerequisites:

Introduction to Computer Science and Introduction to Programming.

Grading

The grade will be based upon the following criteria :

Two closed book exams(theoretical) ---------- 20%

Two closed book exams(practical) ---------- 10%

programmingAssignments ---------- 5%

Attendances ---------- 2%

Quizzes ---------- 3%

Final exam(theoretical) ---------- 40%

Final exam(practical) ---------- 20%

Textbooks

- **Data Structures by Jem Keogh**
- **Data Structures using C by Aaron M.**
- **هياكل البيانات عصام الصفار 2001**

Course programme

Week1: Introduction

Week2: Primitive data structures their storage structures

Week3: Arrays

Week4: Arrays

Week5: Strings (1)

Week6: Strings (2)

Week7: List (1)

Week8: List (2)

Week9: Dynamic allocated data

Week10: Pointers, dynamic allocated records

Week11: Linked List (1)

Week12: Linked List (2)

Week13: Linked List (3)

Week14: Exam (1)

Week15: Stack (1)

Week16: Stack (2)

Week17: Queue (1)

Week18: Queue (2)

Week19: Tree (1)

Week20: Tree (2)

Week21: Graph (1)

Week22: Graph (2)

Week23: Exam (2)

Week24: Recursion

Week25: Sorting Algorithms

Week26: Searching Algorithms

Week27: Files (1)

Week28: Files (2)

Week29: Projects Discussion

Week30: Reviewing