The University of Jordan

School of Engineering

Computer Engineering Department

Fall Semester 2021/2022

Course	Data Structures and Algorithms –0907346 (3 Cr. – Core Course)
Catalog Description	Asymptotic notation, stacks, queues, elementary sort, divide-and-conquer, merge sort, quick sort, heaps, priority queues, heap sort, symbol tables, binary search trees, hash tables, separate chaining, linear probing, undirected and directed graphs, breadth-first search, depth-first search, Dijkstra's algorithm.
Prerequisites by Course	0907342
Prerequisites by Topic	Students are assumed to have had sufficient knowledge pertaining to 1. Explain basic elements in programming, such as assignments, expressions, control statements, and loops 2. Write and test Java programs
Textbook	Robert Sedgewick and Kevin Wayne, Algorithms, 4th Edition, Addison-Wesley Professional, 2011
Additional References	1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein,Introduction to Algorithms, Third Edition, MIT press, 2009. 2. Y. Daniel Liang, Introduction to Java Programming and Data Structures, Comprehensive version, 11th edition, Pearson, 2017
Website	Ramzi.ucoz.com
Schedule & Duration	Section 1**:** 15 Weeks, 30 lectures, 75 minutes each (including exams)
Office Hours	Sun, Tue, Thu 10:30 – 11:30
Student Material	Text book, class handouts, lecture notes, and any additional reading assigned by the instructor
College Facilities	Classroom with whiteboard and projection display facilities, library, and computer laboratory.
Course Objectives	The objectives of this course is to help students to: 1. Use mathematical models to analyze the performance of algorithms 2. Demonstrate an understanding of basic data structures and algorithms 3. Demonstrate an ability in using knowledge of data structures and algorithms to use programming for solvingmathematical and engineeringproblems.

Course Outcomes and Relation to ABET Program Outcomes

Upon successful completion of this course, a student should be able to:

1. Explain the fundamental concepts of commonly used data structures and algorithms [1].
2. Formulate and implement algorithms to solve programming problems under time and memory constraints [1].

Course Topics

1. Analysis of algorithms and asymptotic annotations [section 1.4]
2. Linked Lists, Resizing-arrays, Queues and Stacks [section 1.3]
3. Selection sort, insertion sort, merge sort, quick sort [sections 2.1, 2.2, 2.3]
4. Heaps,Priority Queues and heap sort [section 2.4]
5. Symbol tables: binary search trees and hash tables [sections 3.1, 3.2, 3.4]
6. Undirected and directed graphs, breadth-first search, and depth-first search [sections 4.1, 4.2]
7. Shortest-path problem and Dijkstra's algorithm [section 4.4]

Computer Usage

Practical aspects of the course will be covered by programming assignments

Policies

- Attendance is required. Class attendance will be taken every class and the university's policywill be enforced in this regard
- All submitted work must be yours
- Cheating will not be tolerated
- All materials and announcements will be posted on Ms Teams Platform
- Check department announcements at: http://www.facebook.com/pages/Computer-Engineering-Department/369639656466107 for general department announcements.

Grading policy

Quiz	10%
Programming assignments	10%
Midterm Exam	30%
Final Exam	50%

Instructors

Dr. Ramzi Saifan
Room: CPE 418

Office Hours: S T TH, 10:30 – 11:30

Program Outcomes (PO)

1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	an ability to communicate effectively with a range of audiences
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.