

BIRZEIT UNIVERSITY
Faculty of Engineering and Technology
Department of Computer Science
COMP242 – Data Structures
Course Outline – 2nd Semester 2016/2017

Course Description:

This course introduces some basic data structures (arrays, linked lists, stacks, queues, trees and heaps) and algorithms (various sorting, searching, and hashing). We will also cover recursion in this course. The use of data structures in programming languages and relevant aspects of data and file management will be illustrated using an object oriented language.

Course Goals:

The primary goal of this course is to enhance students' knowledge and understanding of algorithms and data structures and the associated design and analysis techniques. This course aims at developing the students' ability to design and implement data structures and algorithms, analyze them for correctness and efficiency, and choose the right data structure/algorithm for a particular job.

Prerequisites:

- COMP231 -- Advanced Programming

Instructor(s):

<u>Sec. #</u>	<u>Instructor Name</u>	<u>Office</u>	<u>Office Hours</u>	<u>T.A.</u>
1	Iyad Jaber	Masri319	SMW 10:30-11:00 SMW 12:00-13:00	Ali Asfour
2	Majdi Mafarja	Masri318	SMW 11:30-12:30 T 11:00-12:00	

Course Materials:

- Data Structures and Algorithm Analysis in Java (3rd Edition) by Mark A. Weiss. (2011).

Methods of Instruction:

- Lectures, lab, and 4 engaging programming projects.

Student Evaluation:

- Lab work and Quizzes 15%
- Midterm exam 30%
- 4 projects 20%
- Final exam 35%

Course Outline:

	Description	# of Lectures (1 hours)
1	Recursion	2
2	Algorithm Analysis	5
3	Lists, Linked Lists, Double Linked Lists, examples	3
4	Cursor Implementation of Linked Lists, Stacks	3
5	Implementation of Stacks, Examples, Queues	3
6	Trees, Implementation of Trees, Binary Trees	2
Projects 1 & 2 discussion		
7	Expression Trees, Binary Search Trees	2
8	AVL Trees, Single and Double Rotation, Tree Traversals	3
9	Splaying, B_Trees	2
Midterm Exam (30%)		
10	Hashing	4
11	Priority Queues (Heaps)	4
12	Sorting, Design Techniques, Merge Sort, Analysis of Merge Sort	2
13	Quick Sort , Analysis of Quick Sort, Linear Sorting Algorithm, Shell Sort, External Sort	4
Projects 3 & 4 discussion		
Final Exam (35%)		

Special Regulations:

- Late Assignments will **NOT** be accepted for any reason.
- Missing any exam without an **acceptable** excuse will result in a zero grade for that exam.
- There will be **NO** makeup quizzes.
- Academic **honesty**:
 - o Individual projects must be each student's own work.
 - o Cheating will result an official university disciplinary review.

Lab Outline

Week	Title	Quizzes
1	Lab 1: Recursion	
2	Lab 2: Singly Linked List Implementation of the List ADT	
3	Lab 3: Doubly Linked List Implementation of the List ADT	
4	Lab 4: Cursor Implementation of List ADT	
5	Lab 5: Stack ADT	Q1
6	Lab 6: Queue ADT	
7	Lab 7: Binary Search Tree	
8	Lab 8: AVL Tree	Q2
9	Lab 9: Hash Tables	
10	Lab 10: Heaps	
11	Lab 11: Sorting 1	
12	Lab 12: Sorting 2	Q3

Good Luck!