

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE

Course Code: CSC 224

Course Title: Data Structures

Purpose

This course unit is designed to focus on implementation and mathematical analysis of fundamental data structures and algorithms. It covers storage allocation and memory management techniques.

Objective

- To appreciate how computing systems may be implemented using data structures.
- To appreciate application of data structures in solutions to common computing requirements.

WEEK 1

- Introduction to object technology; data Abstraction, Inheritance, Polymorphism, classes, objects.

WEEK 2

Basic Data structures

- Arrays: Array implementation; Application (RPN Usage in Web browsers, Word editors, Method call management)
- List data structure-Linked Lists: implementation; Application

WEEK 3

Non linear Structures

- Trees-Binary Trees: Array implementation, linked list implementation

Assignment 1

WEEK 4

- Binary Search trees: Tree traversals
- Binary heaps

WEEK 5

Abstract data types

- Stacks: implementation; Application

CAT 1

WEEK 6

- Queues: Implementation;
- The set data structure

WEEK 7

- Priority queues.

Introduction to Graphs

WEEK 8

- Practice on graph theory

Assignment 2

WEEK 9

Application of Huffman codes;

- Overview of area of application

WEEK 10

Searching Algorithms

- Sequential/Linear search
- Binary search

CAT 2

WEEK 11

Sorting algorithms:

- Bubble sort;
- Heap sort
- Selection sort

WEEK 12

Recap of the data structures concepts

Revision of CATs and Assignments

Assessment:

- Assignments, Practical Exercises.....15%
- CATs----- 15 %
- Written / main Examinations----- 70 %

Reference

- Anany Levitin - Introduction to The Design and Analysis of Algorithms
- Data structures with Java, John R. Hubbard, c. 2004
- Absolute Java, Walter Savitch, 3rd Edition
- Jon Kleiberg – Algorithm Design

CONTACTS:

Mr. Omieno K.K.

Tel: +254726849197 Mail: komieno@mmust.ac.ke or kelvin.omieno@gmail.com

Consultation Time: Tuesday- 8.00-10.00 Hours & Wednesday – 8.00- 10.00 Hours

OFFICE: LBB 016