

# National Institute of Technology - Trichy 620015

## Data Structures      Core – 3:0 Theory B.Tech./CS

### Instructor

Dr.K.Viswanathan Iyer

Professor

CSE 102 Ground Floor

Dept. of Computer Science & Engg.

Mobile 9487487681

email kvi[AT]nitt.edu.

### Pre-requisites

1. Knowledge of computer programming with C or Java is required.
2. Basics of Computer Organization will be helpful.
3. A basic understanding of computer-based problem solving will be helpful.

### Course Overview

A fast paced review of programming language concepts and notion of algorithms as a step-by-step procedure to solve problems on a computer will begin the course. This will include basic constructs, use of functions and procedures, parameter passing mechanisms, recursion, operation counts, asymptotic notations. The course will then start with basic ideas of data structures and their illustration through a series of graded examples. The use of arrays and matrices, stacks, queues and their variants will be explored with a focus on implementation. This will be followed by manipulation of linked lists including circular lists, doubly linked lists. An introduction to dynamic memory management will be taken as a case study. Trees and heaps and their uses will be discussed subsequently. Examples in sorting and other domains will be given as the course progresses. Hash tables, binary search trees and RB-trees will be covered next. An introduction to data structures using disjoint sets will follow next. Basic manipulations of graphs and graph algorithms will also be covered. Throughout, the lectures will emphasise algorithmic manipulations in the use of data structures and useful mathematical analyses in the design of efficient algorithms and program codes.

### Course objectives and expected outcomes

- The primary objective is to provide students with a good introduction to commonly used data structures in the design of algorithms for different problems. This will help the students to design efficient algorithms and write good codes even when new problems in other domains are encountered.
- A second objective is to provide insight into some commonly studied advanced topics that are useful in the design of optimised codes.
- The expected outcome is that 45% of the students will be immediately ready to tackle challenges in the software industry with respect to the knowledge pertaining to this course. The next 45% of the students will find the course interesting enough to be motivated and get involved in the technical aspects covered in the course. About 50% of the students will be able to probe more into advanced level applications in other areas such as Internet technology, database systems.

## Course teaching-learning activities

There will be three to four classes per week. As a policy the announced time-table will be followed. Lectures will be delivered with pointers to references. Sometimes handouts will be posted. Subject to availability of time-slots, problem-solving sessions will be conducted – this will be apart from the three hour per week schedule.

## Course assessment plan

There will be 1 quiz, 1 assignment, 2 tests, 1 final examination. The weightages and durations are as under.

1 quiz:	10 marks	-	45 minutes
1 assignment:	10 marks	-	take about 3 hours time
2 tests: 20 + 20 =	40 marks	-	1 hour each test
1 final exam. :	40 marks	-	3 hours

The exact dates will be announced in the first week in the class and will be posted. Any changes will necessarily appear in the department notice board also.

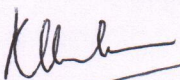
## Course feedback from students

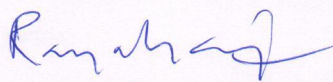
Students are expected to give feedbacks as directed: one during mid-way during the progress of the course, may be after the first test and one at the end of the course.

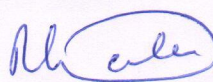
## Course policy, academic honesty, attendance, copying

Academic integrity and honesty will be enforced strictly. Copying in assignments will also attract punishment.

*For attendance the default rules & regulation will be followed*

  
Instructor  
6F July 2017

  
Class committee chairman

  
HOD 13/7/2017