

Course Name: Data Structure and Algorithms	Course Code: ITSE3101
Pre-Requisite: Object Oriented Programming (JAVA)	Credit Hours: 3
Passing Grade: C	Level: Year 3
No. Of Theory & Practical Hours : 1:4	
Goal: To develop proficiency in implementation of Data Structures	
Objectives: The course should enable the student to: <ol style="list-style-type: none"> 1) Analyze the complexity of algorithms. 2) Implement list, stack, queue, tree and graph data structures. 3) Implement searching, sorting and hashing techniques. 4) Implement data structures. 	
Outcomes At the end of this course, students should be able to:	Method
1) Use arrays, Pointers, Structures and Abstract data types	Theory and Practical
2) Discuss Big Oh, Theta and Omega notations	Theory and Practical
3) Apply Big Oh to calculate complexities of algorithms	Theory and Practical
4) Implement Linear list and single, circular and doubly linked lists	Theory and Practical
5) Implement stacks, queues and tables using linear and linked representation	Theory and Practical
6) Use Linear and Binary Search	Theory and Practical
7) Apply operations on trees such as traversal (Pre-order, In-order and Post-Order), searching, insertion, updating and deletion.	Theory and Practical
8) Construct Binary Tree and Binary Search Tree (BST)	Theory and Practical
9) Use Insertion, Selection, Bubble, Quick, Merge, Radix sorting	Theory and Practical
10) Construct Graphs	Theory and Practical
11) Implement hashing techniques	Theory and Practical
12) Use algorithms to perform operations such as insertion, searching, updating and deletion on various data structures	Theory and Practical
13) Implement data structures.	Practical

Hardware /Software Tools: 1) C++, Java
Text Book: Lipschutz. S, Data Structures Tata Mc-Graw Hill, Schaum's Outlines, 2006.
Reference Book: Langsam. Y, M. Augenstin and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition, 2002 .