

With effect from the A.Y 2018-19

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS FOR B.E IV SEMESTER**

**INTRODUCTION TO DATA STRUCTURES
Open Elective-III (for other Departments)**

Instruction: 2 Hrs /week	SEE Marks :60	Course Code : OE310CS
Credits :2	CIE Marks: 40	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
Students should be able to	At the end of the course, Students will be able to
<ul style="list-style-type: none">Identify and use appropriate data structure for a given problem with effective utilization of space and time.Describe the linear and nonlinear data structures.	<ol style="list-style-type: none">Implement linear data structures.Develop an application using stacks and queues.Choose the appropriate nonlinear data structure and perform operations on them.Analyze the time and space complexities of Algorithms.

UNIT - I

Arrays: Arrays - ADT, Polynomials, Sparse matrices.

Linked Lists: Singly Linked Lists, Circularly linked lists, Doubly Linked Lists.

UNIT – II

Stacks: Array Representation, Linked Representation, Applications.

Queues: Array Representation, Linked Representation, Applications.

UNIT – III

Introduction to non-linear Data Structures : Tree Definitions and Properties, Representations of Binary Trees, Operations, Binary Tree Traversal, Graph Definitions, properties and representations.

UNIT – IV

Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations

Suggested Books:

- Horowitz E, Sahni S and Susan Anderson-Freed, Fundamentals of Data structures in C, 2nd Edition(2008), Universities Press

Reference Books:

- Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition (2002), Pearson
- Kushwaha D. S and Misra A.K, Data structures A Programming Approach with C, Second Edition (2014), PHI.,
- Gilberg R. F and Forouzan B. A, Data structures: A Pseudocode Approach with C, Second Edition (2007), Cengage Learning
- Tanenbaum A. M ,Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson.
- Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, Introduction to Algorithms, Third Edition (2009), MIT Press
- YedidyahLangsam , Moshe J. Augenstein ,Aaron M. Tenenbaum, Data Structures Using C and C++ , Second Edition (2009), PHI.

Online Resources:

1. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos>
2. <http://nptel.ac.in/courses/106106127/>
3. <http://www.nptel.ac.in/courses/106102064>