Second year of Five Years integrated M.Sc. (Physics)
M.Sc. - II, Semester IV

	L	T	P	C
ES 206 : (Engg. Science Electives)	**3**	**0**	**0**	**3**

BASICS OF DATA STRUCTURE & ALGORITHMS (Deptt – COED)

- **INTRODUCTION** **(06 Hours)**
  Introduction to Data Structure, Primitive and Non-primitive data structure.
- **LINEAR DATA STRUCTURE** **(07 Hours)**
  Definition and analysis of Array, Stack, Queue, String, Link List and application.
- **NON LINEAR DATA STRUCTURE** **(04 Hours)**
  Definition and analysis of Trees, Graph.
- **FILE PROCESSING** **(05 Hours)**
  Study and implementation of Different file organization & access techniques.
- **INTRODUCTION TO ALGORITHMS** **(07 Hours)**
  Introduction to algorithms, Asymptotic notation, Models of Computation, Algorithm & their complexity, Random Analysis machines, Computational complexity of RAM programs, A stored program model, Abstractions of the RAM, A primitive model of computation (Turing Machines).
- **ALGORITHM ANALYSIS** **(05 Hours)**
  Analyzing Algorithm, Designing Algorithm, Time & Space Complexity, Average & Worst case analysis, Lower Bounds.
- **ALGORITHM DESIGN TECHNIQUES** **(08 Hours)**
  Divide & Conquer, Search Traversals, Dynamic Programming, Backtracking, Branch & Bound, Greedy Algorithm.

(Total Contact Time (Theory) : 42 Hours)

BOOKS RECOMMENDED

1. **Trembley & Sorenson**, *An Introduction to Data Structures with Applications*, TMH,2/E,1993, Reprint 1995.
2. **Tanenbaum A.M. & Augenstein M. J**., *Data Structures using C and C++,* PHI, 1981, Reprint 1996.
3. **Sahni**:**S.,** *Data Structures, Algorithms and Applications in C++,* 2/E, Universities Press/Orient Longman, 2005.
4. **Cormen, L. , Rivest , S.**, *Introduction to Algorithms*, 3/E, the MIT Press, 2001.
5. **Kleinberg J., Tardos E**., *Algorithm Design*, 1/E, Pearson Education, 2005.