**Department of Computer Science**

**Lecture Outline**

**Data Structures – 4th CSE**

**Lecture 1 and Lecture 2**

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| 1. Structures | * 1. Definition   2. Declaration   3. Declaring a structure variable   4. Declaring a structure pointer   5. Using typedef   6. Difference between Structure and Union   7. Accessing structure members using a structure variable   8. Accessing structure members using a pointer to the structure   9. Self Referential Structures |
| 1. Dynamic Memory Allocation | * 1. Calloc ()   2. Malloc()   3. Realloc()   4. Free()   5. Syntax and usage of a-d to allocate memory   6. Using sizeof()function |
| 1. Recap of Pointers | * 1. Pointer declaration   2. Pointer Assignment   3. Pointer Size for various data types   4. Pointer arithmetic   5. Passing Pointer to a function   6. Passing pointer by value and by reference   7. Returning Pointer from a function |
| 1. Pointer to a Pointer | * 1. Use of double pointers   2. Extracting value using a double pointer |
| 1. Data Structures | * 1. Definition   2. Types of Data Structures   3. Abstract Data Structure, ADT |
| 1. Strings | * 1. Recap of Strings   2. Implementing String Library Functions |
| 1. Arrays | * 1. Recap of Arrays   2. Arrays and Pointer Arithmetic   3. Row Major and Column Major Representation of Arrays   4. Operations on Arrays ( Insert, Delete, Sort etc )   5. Implementing Arrays using Dynamic Memory Allocation ( Using a pointer and assigning desired size memory block to the pointer and using pointer arithmetic to emulate all functions of arrays)   6. Advantages and Limitations |

