**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
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| 1. Pointer to a Pointer
 | * 1. Use of double pointers
	2. Extracting value using a double pointer
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| 1. Data Structures
 | * 1. Definition
	2. Types of Data Structures
	3. Abstract Data Structure, ADT
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| 1. Strings
 | * 1. Recap of Strings
	2. Implementing String Library Functions
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| 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
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