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| logo | **NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY**  NAAC Accredited with “A+” grade  Autonomous Institute under Visvesvaraya Technological University (VTU)  **DEPARTMENT OF CSE(DATA SCIENCE)** |

**COURSE PLAN**

***(To be submitted before commencement of semester)***

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| **Course Name**: Data structures and applications | **Course Code**: 22CDT34 | |
| **Course Credits: 03** | **Course L:T:P: 3:0:0:0** | **Semester : VII** |
| **Course Teacher/s: MRS.SUSHMA B S** | **Academic Year:** 2022-23 | |
| **Lab. Instructors (if applicable):** | **Date of Commencement of Class:17.10.2023** | |

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**LECTURE PLAN:**

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| **Topic** | **Topic Details** | **Lecture No.** | **Week** | **Textbook/**  **reference book** | **Chapter number/Page no.** | **Percentage of**  **Syllabus**  **coverage** |
| **Module-I** | Data Structures, Classifications (Primitive & Non Primitive), | 1 | **Week 1** | TB |  | 20% |
| Data structure Operations, | 2 | TB |  |
| Arrays | 3 | TB |  |
| Structures | 4 | **Week 2** | TB |  |
| Self-Referential Structures , and Unions. | 5 | TB |  |
| Pointers and Dynamic Memory Allocation Functions. | 6 | TB |  |
| Pointer as function arguments, | 7 | **Week 3** | TB |  |
| Functions returning pointers. | 8 | TB |  |
| **Module II** | Stacks: Definition, Stack Operations, Array Representation of Stacks | 9 | **Week 4** | TB |  | 20% |
| Array Representation of Stacks, Stacks using Dynamic Arrays, | 10 | TB |  |
| Stack Applications: Polish notation, Infix to postfix conversion, evaluation of postfix expression | 11 | TB |  |
| evaluation of postfix expression | 12 | **Week 5** | TB |  |
| Recursion - Factorial, GCD, Fibonacci Sequence, Tower of Hanoi, Binary Search | 13 | TB |  |
| Queues: Definition, Array Representation, | 14 | **Week 6** | TB |  |
| Queue Operations, Circular Queues, | 15 | TB |  |
| Circular queues using Dynamic arrays, Dequeues, Programming Examples. | 16 | TB |  |
| **Revision** |  | | | | | |
| **AAT 1** |
| **Module III** | Linked Lists: Definition, Representation of linked lists in Memory | 17 | **Week 7** | TB |  | **20%** |
| Memory allocation; Garbage Collection. | 18 | TB |  |
| Linked list operations: Traversing, Searching, Insertion, and Deletion | 19 | **Week 8** | TB |  |
| Doubly Linked lists and header linked lists | 20 | TB |  |
| Linked Stacks and Queues. | 21 | TB |  |
| Linked Stacks and Queues. | 22 | **Week 9** | TB |  |
| Sparse Matrices, Programming Examples. | 23 | TB |  |
| Sparse Matrices, Programming Examples. | 24 | TB |  |
| **Module IV** | Circular lists and it’s basic operations: Circular Singly. | 26 | **Week 10** | TB |  | 20% |
| Circular lists and it’s basic operations: Circular Singly. | 27 | TB |  |
| Doubly linked lists; Basic operations: Insert | 28 | **Week 11** | TB |  |
| Delete and Display | 29 | TB |  |
| Applications of linked lists: Addition of long positive integers using circular list, | 30 | TB |  |
| Adding Polynomials | 31 | **Week 12** | TB |  |
| Hashing: Hash tables, Hash function. | 32 | TB |  |
| Overflow handling: Open Addressing, Chaining. | 33 | TB |  |
| **Revision** |  | | | | | |
| **AAT2** |  | | | | | |
| **Module V** | Trees: Terminology, Binary Trees, Properties of Binary trees | 34 | **Week 13** |  |  |  |
| Array and linked Representation of Binary Trees | 35 |  |  |
| Binary Tree Traversals - Inorder, postorder, preorder; | 36 | **Week 14** |  |  |
| Threaded binary trees, | 37 |  |  |
| Binary Search Trees – Definition, Insertion, Deletion, Traversal, Searching | 38 |  |  |
| Binary Search Trees – Definition, Insertion, Deletion, Traversal, Searching | 39 | **Week 15** |  |  |
| Application of Trees-Evaluation of Expression, Programming Examples | 40 |  |  |
| **Revision** |  | | | | | |

**TEXTBOOKS AND REFERENCE BOOKS:**

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| **Book Type** | **Code** | Title & Author | **Publication Information** | | |
| **Edition** | **Publisher** | **Year** |
| **Text Books** | **T1** | Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures in C. | 2nd Ed, | Universities Press | 2014. |
| **T2** | Seymour Lipschutz, Data Structures Schaum's Outlines. | Revised 1st Ed, | McGraw Hill, | 2014. |
| **Reference Books** | **R1** | Gilberg & Forouzan, Data Structures: A Pseudo-code approach with C. | 2nd Ed, | Cengage Learning, | 2014. |
| **R2** | Reema Thareja, Data Structures using C, | 3rd Ed, | Oxford press, | 2012. |

**COURSE OUTCOMES:**

***At the end of the course the student will be able to:***

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| **CO1** | Learn the leading trends and systems in natural language processing |
| **CO2** | Student will be able to understand the concepts of morphology, syntax, semantics and pragmatics of the language and that they are able to give the appropriate examples that will illustrate the above mentioned concepts |
| **CO3** | Student will be able to understand the significance of pragmatics for natural language understanding |
| **CO4** | Students will be capable to describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing. |

**CO-PO MAPPING:**

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| **POS** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PS01** | **PS02** | **PS03** |
| **COs** |
| **C202. 1** | 1 | 1 | 1 |  |  |  |  |  | 1 | 1 |  | 1 |  |  | 3 |
| **C202. 2** | 1 | 2 | 3 |  |  |  |  |  | 1 | 1 |  | 1 |  |  | 3 |
| **C202. 3** | 2 | 2 | 3 |  |  |  |  |  | 1 | 1 |  | 2 |  |  | 3 |
| **C202. 4** | 2 | 2 | 3 | 2 |  |  |  |  | 1 | 1 |  | 2 |  |  | 3 |
| **C202. 5** | 2 | 2 | 3 | 2 |  |  |  |  | 1 | 1 |  | 2 |  |  | 3 |
| **AVERAGE** | 2 | 2 | 3 | 2 |  |  |  |  | 1 | 1 |  | 2 |  |  | 3 |

**COURSE EVALUATION SCHEME:**

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| **Component** | | **Weightage (%)** | | |
| **CIE’s** | CIE 1 5th week | 20 | 60 | (Scaled down to 30 marks)  30 marks |
| CIE 2 10th week | 20 |
| CIE 3 15th week | 20 |
| **AAT’s** | AAT1 | 10 | 40 | (Scaled down to 20 marks)  20 marks |
|  | AAT2 | 10 |
|  | AAT3 | 20 |
| **Continuous Internal Evaluation Total Marks: 100. Reduced to 50 Marks**  **The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50)** | | | | |
| **Semester End Examination (SEE) Total Marks: 100. Reduced to 50 Marks**  **The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50)** | | | | |

**Signature of the Course Co-Ordinator**  **Signature of the HOD**

Date:06.10.23

**Note:**

1. The Course plan is an attempt to ensure **continuous improvement** in the TLP of the course.
2. The proposed Course Plan shall be submitted to **DAC** before the commencement of the semester.
3. At the end of the semester, the faculty shall submit the **Actual Implemented Lesson Plan**.
4. Calendar of Events shall also be included along with this lesson plan.