**Advanced Data Structures and Algorithm Analysis**

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| **Course Code** | 23CS3301 | **Year** | II | **Semester** | II |
| **Course Category** | PC | **Branch** | CSE/IT | **Course Type** | Theory |
| **Credits** | 3 | **L-T-P** | 3-0-0 | **Prerequisites** | Data structures |
| **Continuous Internal**  **Evaluation :** | 30 | **Semester End Evaluation:** | 70 | **Total Marks:** | 100 |

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| **Course Outcomes** | | **Blooms Level** |
| Upon successful completion of the course, the student will be able to: | | |
| **CO1** | Understand the fundamental concepts of algorithm analysis and design techniques. | L2 |
| **CO2** | Apply various algorithm design techniques for solving problems | L3 |
| **CO3** | Apply the concepts of Trees and Graphs for solving problems effectively. | L3 |
| **CO4** | Analyze the given scenario and choose appropriate algorithm design for solving problems. | L4 |

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| **Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial,2:Moderate,1:Slight)** | | | | | | | | | | | | | | |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** | 3 |  |  |  |  |  |  |  | 1 | 1 |  |  | 3 | 1 |
| **CO3** |  | 2 |  |  |  |  |  |  | 1 | 1 |  |  | 3 | 1 |
| **CO4** |  | 2 |  |  |  |  |  |  | 1 | 1 |  |  |  |  |
| **Avg.** | **3** | **2** |  |  |  |  |  |  | **1** | **1** |  |  | 3 | **1** |

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| **CO 1** | **“**Understand the fundamental concepts of algorithm analysis and design techniques**”** |
| **PO1** | **Engineering Knowledge**  **Justification:** Understanding Data structures and Algorithm Analysis and its usage in solving various problems will help them to understand the problem, apply the suitable algorithm technique and data structure and analyse its resources (time and space) build applications effectively. |
| **CO 2** | Apply various algorithm design techniques for solving problems |
| **PO1** | **Engineering Knowledge**  **Justification:** Understand and apply an appropriate algorithm design technique for solving a problem. |
| **PO9 & PO10** | **Individual and Team Work, Communication Skills**  **Justification:** Assignment are given to students/group to apply suitable data structure for the problems and submit a report, which is used to enhance the written communication in the student. |
| **PSO1** | **Apply the Knowledge of Computing Skills in building the Software Systems that meet the requirements of Industry and Society.**  **Justification:** Building the software products in a optimized way need strong understanding and apply of algorithm techniques. |
| **PSO2** | **Apply the Knowledge of Data Engineering and Communication Technologies for Developing Applications in the Domain of Smart and Intelligent Computing.**  **Justification:** Building the software products in a optimized way need strong understanding and apply of algorithm techniques**.** |
| **CO3** | Apply the concepts of Trees and Graphs for solving problems effectively. |
| **PO2** | **Problem Analysis**  **Justification:** Every application contains the data and process (algorithm /technique) that work on data. So, representation of data in the form of trees or graphs makes the modification / retrieval of data improves the performance of the application. |
| **PO9 & PO10** | **Individual and Team Work, Communication Skills**  **Justification:** Assignment are given to students/group to analyze the problems and submit a report which is used to enhance the written communication in the student. |
| **PSO1** | **Apply the Knowledge of Computing Skills in building the Software Systems that meet the requirements of Industry and Society.**  **Justification:** Building the software products in a optimized way need a strong understanding of data organizing in the application and apply suitable data structure to improve the performance |
| **PSO2** | **Apply the Knowledge of Data Engineering and Communication Technologies for Developing Applications in the Domain of Smart and Intelligent Computing.**  **Justification**: Building the software products in a optimized way need a strong understanding of data organizing in the application and apply suitable data structure to improve the performance. |
| **CO4** | Analyse the given scenario and choose appropriate algorithm design for solving problems. |
| **PO2** | **Problem Analysis**  **Justification:** Analyze the given new problem and identify suitable data structure and algorithm technique require strong understanding of existing problems data structure and algorithm used which can be achieved by analyzing the existing problem in the direction of data structure and algorithm technique used. |
| **PO9 & PO10** | **Individual and Team Work, Communication Skills**  **Justification:** Assignment are given to students/group to analyze the problems and submit a report which is used to enhance the written communication in the student. |

Course Coordinator:

Module Coordinator: Signature of HOD