**RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY(AUTONOMOUS)**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**PROGRAMME: Computer Science and Business Systems (CSBS)**

**VISION**

To evolve into a department of excellence in information technology by the creation and exchange of knowledge through leading-edge research, innovation and services, which will in turn contribute towards solving complex societal problems and thus building a peaceful and prosperous mankind.  
  
**MISSION**

To impart high-quality technical education, research training, professionalism and strong ethical values in the young minds for ensuring their productive careers in industry and academia so as to work with a commitment to the betterment of mankind.

**PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

Graduates of Information Technology program shall

**PEO 1**: Have strong technical foundation for successful professional careers and to evolve as key-players / entrepreneurs in the field of information technology.

**PEO 2:** Excel in analyzing, formulating and solving engineering problems to promote life-long learning, to develop applications, resulting in the betterment of the society.

**PEO 3:** Have leadership skills and awareness on professional ethics and codes.

**PROGRAM OUTCOMES (PO)**

Information Technology program students will be able to:

**PO 1. Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals,   and an engineering specialization to the solution of complex engineering problems.

**PO 2**. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO 3**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO 4*.* Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO 5*.* Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO 6*.* The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO 7*.* Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO 8. Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO 9. Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 10. Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO 11*.* Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO 12. Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**101009/IT422T**

**DESIGN AND ANALYSIS OF ALGORITHM LAB  
Course Outcomes**

After the completion of the course the student will be able to:

CO 1:Analyze a given algorithm and express its time and space complexities in

asymptotic notations.

CO 2: Solve recurrence equations using Iteration Method, Recurrence Tree Method

and Master’s Theorem.

CO 3: Solve Optimization problems using Greedy strategy,Dynamic strategy,Back

Tracking and Branch Bound Techniques.

CO 4: Get an overview of Approximation and Randomized algorithms.

**Lab Cycle**

**Week 1:**

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| 1. **Time Space Trade off Implementation** 2. Let S be an integer array of n elements perform two operations  * remove(i)-I is removed from S * next(i)- returns the next larger element j, where j>i, jε S, if such j exists. Implement the same using linked list.  1. Make observations on the two methods and comment on time-space tradeoff.   **Week 2:**   1. **Time analysis of different sorting methods**   Sort a given set of elements using the Quicksort and bubble sort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be generated using the random number generator.  **Week 3,4:**   1. **Dynamic programming implementation**   Implement 0/1 Knapsack problem **,** Travelling salesman problem  **Week 5:**   1. **Backtracking method implementation**   Bin packing problem implementation  **Week 6:**   1. **Implement Minimum Spanning Tree algorithm – Prim’s and Kruskal’s(Greedy methodology)** 2. Implement MST using Kruskal’s or Prims algorithm(half of the students will do Prim’s and the rest will do Kruskal’s)   **Week 7:**   1. **Graph traversals using adjacency list and adjacency matrix** 2. Find connected component in a graph 3. Perform topological sorting in the graph. |