SCMS School of Engineering & Technology

**Department of Electronics and Communication Engineering**
**SCMS School of Engineering and Technology**

# Add-on course on

# BASICS OF ALGORITHMS, DATA STRUCTURES AND PROGRAMMING

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**Course Instructor:**
Vineeth R Pillai,
Senior Software Engineer, Google


## Instructor Bio

Mr. Vineeth R Pillai has about 15 years of experience in the industry and has been a part of companies like SUN Microsystems, Microsoft and Amazon. He has worked on a variety of technologies ranging from system programming and operating systems all the way to highly complex distributed systems. He has been in the interview board in all the companies he has worked for and has a thorough understanding of what companies are looking for in prospective candidates.

He has a great interest in teaching and mentorship and is really passionate about training young minds to become future successful computer science professionals.

## COURSE HIGHLIGHTS


**Internal Course Coordinator:**
Ajit Joseph
ECE Department, SSET
**E-mail:** ajit@scmsgroup.org
**Mob:** 9495108681


**Mode of Delivery:** Online

**Number of Hours:** 30 Hours

**Target Audience:** 2nd Yr. and 3rd Yr. students of ECE

**(Limited Seats available)**

**Course Start Date**: 23-02-23

**Online Class Schedule:**
Every Mondays and Wednesdays
8:15 pm to 9:15 pm (1 hour)

**Course Fees**: 500/-

*(Amount will be refunded to students who successfully complete the course)*

***Completion will be counted towards KTU Activity point.***

## Brief Introduction on the course

This Course is designed as an introduction to programming for non CS/IT Engineering Students designed to help students understand the industry requirements and hence help them during placements. CS/IT students may find it useful as well, but the curriculum is well covered for CS and IT majors and may find this repetitive. The course includes a basic introduction to Computer architecture and dwells more into programming, algorithms and data structures. The course also basically touches upon understanding the efficiency of an algorithm in terms of its compute and memory requirements. C is used as the basic language to introduce programming to the students. Successful conduct of this course will be preceded by a second part of this course. Second part of the course is about python programming and students get a chance to compare and contrast two different languages to understand the power and weakness and use cases of these languages.

After Successful completion of this course, students will be able to understand programming methodologies, develop a mental model of an algorithm and convert the algorithm to a computer program with a choice of programming language.

**Course Outcomes:**

1. Understanding of data structures, algorithms and its complexity.
2. Present algorithm in C program.
3. Understand the efficiency of an algorithm.

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| Week -1 | Basics of computer architecture | 2Hrs |
| Week -2 | Computer programs, programming languages, classifications | 2Hrs |
| Week -3 | Basics of C Programming: Data types, variables, Control structures. Basics concepts about algorithms. | 2Hrs |
| Week -4 | Data structures and its importance in computer programming. | 2Hrs |
| Week -5 | Basics of C Programming: Functions, Concepts of recursion. | 2Hrs |
| Week -6 | Basics of C Programming: Pointers, pointer arithmetic and manipulation | 2Hrs |
| Week -7 | Basics of C Programming: C Preprocessor, Sample programs | 2Hrs |
| Week -8 | Understand performance characteristics of algorithms. Algorithms: Searching, Binary Search. | 2Hrs |
| Week -9 | Algorithms: Sorting, Bubble sort, Insertion sort, Merge Sort, Quick Sort | 2Hrs |
| Week -10 | Data structures : Arrays, Linked Lists | 2Hrs |
| Week - 11 | Data structures : Binary Trees, Tree Traversals | 2Hrs |
| Week - 12 | Data Structures: Graphs, BFS, DFS | 2Hrs |
| | 6 hours of Lab split among 12 weeks | 6Hrs |
| Course Final Assessment | | |

## System Requirements:

Laptop/Desktop with 4GB RAM, Windows 10 or Windows 11 OS, Chrome or Microsoft Edge

## Criteria for successful Completion of the course:

Student should have an online attendance of 75% and submitted 80% of the assignments on time.

**Final Score :** 75 marks for assignment + 25 marks for final assessment test = 100.

**Certificates will be awarded to students who get above 45% in the final score with at least 10 marks in final exam.**